TAKE THE IQ CHALLENGE 3

PHILIP J. CARTER
& KEN A. RUSSELL

Joint editors of the
MENSA (UK) PUZZLE GROUP JOURNAL

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& Kenneth A. Russell

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CONTENTS

Acknowledgements 6
Introduction 7
About the Puzzles 8

Potpourri 9
Anagrams 16
Numbers 25
Word Play 35
Diagrams 48
Quotations 54
Magic Squares 59
Kickself 68
Codes and Ciphers 75
Crossword Variations 80
Brainbenders 94
Russell Squares 102
Et Cetera 106

Answers 116

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INTRODUCTION

We are delighted to have had the opportunity to produce this book, which is the third in the series of *Take the IQ Challenge* books, and to be able to share our interest in puzzles with you. It is through our membership of Mensa, the High-IQ society, and in particular our involvement with Enigmasig, the special-interest group within Mensa devoted to the setting and solving of puzzles, that the two of us have formed the friendship and partnership which has led to this series of books and has enabled us continually to devise new and original types of puzzles.

Founded in 1946, Mensa is a society where the sole qualification for membership is to have attained a score, in any supervised test of general intelligence, which puts the applicant in the top 2 per cent of the general population. The name 'Mensa' is Latin for 'table', indicating a round table society which aims to include intelligent people of every opinion and calling, where all members are of equal standing within the society.

Mensa is perhaps best described as a social club where members communicate with other members through correspondence, meetings, think-ins, dinners, special-interest groups, magazines, lectures and international gatherings. Membership of the society gives us enormous interest and pleasure. If you wish to learn more about Mensa, and how to take the Mensa Entrance Test, then why not write for details to one of the addresses below? If you are successful, then we are sure you will find that the efforts involved are far outweighed by the enjoyment you will derive.

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16 Elliot Avenue
Carnegie
Victoria 3163

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Mensa International Ltd
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London N1 2HY

To enable you to monitor your performance throughout the book we have allocated to each puzzle one of the following star ratings:

* Standard
** More challenging
*** Difficult
**** Appallingly difficult

You will see that each puzzle is cross-referenced with two numbers, a question number and an answer number (A). This has enabled us to mix up the answers section so that there is no risk of seeing the next answer before tackling the puzzle.

'Here as elsewhere we shall not obtain the best insight into things until we actually see them growing from the beginning.'

Aristotle

Specially selected to limber up your mind for what is to follow, and to provide you with a possible insight into the devious workings of our own minds, the miscellany which comprises our first section should give you a flavour of the variety of brainteasers which we will be presenting throughout the book.

We have set out to intrigue and amuse you and hope that you will spend many enjoyable hours being entertained by our book. Good luck and happy solving!

*1

Find Another Word

Consider the following list of words:

SEAT, LINE, FOOT, HOUSE.

Now choose one of the following words to add to the list:

TABLE, BED, CUPBOARD, WINDOW, FLOOR

(*See A108*)

**2

Something in Common

What have the following in common?

A MINE
A HOLM OAK
A HUT

(*See A66*)

**3
The Energetic Dog

A man is walking his dog on the lead towards home at a steady 3 m.p.h. When they are 7 miles from home the man lets his dog off the lead. The dog immediately runs off towards home at 8 m.p.h. When the dog reaches the house it turns round and runs back to the man at the same speed. When it reaches the man it turns back for the house. This is repeated until the man gets home and lets in the dog. How many miles does the dog cover from being let off the lead to being let into the house?

(*See A17*)

**4
Harem

A sultan tried to increase the number of women available for harems in his country by passing a law forbidding women to have another child once they gave birth to a son; as long as the children were girls they would be permitted to continue childbearing. 'Under this new law,' the sultan explained, 'you will see women having families such as four girls and one boy; ten girls and one boy; perhaps a solitary boy, and so on. This should obviously increase the ratio of women to men.'

Is this true?

(*See A30*)

*5
Wot! No Vowels

Find 14 words of three or more letters contained in the grid. Words run in any direction, backward and forward, horizontal, vertical and diagonal, but only in a straight line.

Y	P	M	Y	L	S
S	R	H	X	Y	P
L	H	T	Z	M	Y
Y	S	Y	L	P	H
L	G	H	L	H	W
Y	H	R	R	Y	M

(*See A42*)

**6

Odd One Out

Which is the odd one out?

AIL
NOT
ROW
INCH
LOVER
THREAD

(*See A44*)

*7

Figure It Out

There is a single feature that these words have in common. What is it?

ENUMERATE
UNOCCUPIED
ONEROUS
UNUSUAL
BIRD

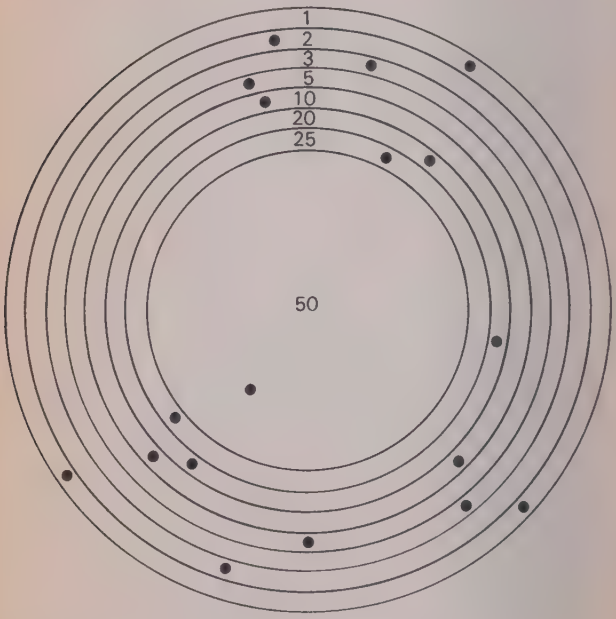
(*See A113*)

**8

Shooting Match

Victor, Madsen and David each fired six shots, and each got 71 points. Victor's first two shots scored 22 points and Madsen's first shot scored only 3 points.

Who hit the bull's eye?



(*See A2*)

**9
Square

Divide the square into four identical sections. Each section must contain the same nine letters, which can be arranged into a nine-letter word.

O	P	C	N	C	P
C	Y	H	O	Y	O
C	P	A	C	O	N
H	N	O	C	A	H
A	Y	P	H	Y	O
O	C	A	N	O	C

(*See A126*)

To the purist a true anagram is a word or phrase the letters of which can be rearranged into another word or phrase which bears some relationship to the original. Our first puzzle in the section, Appropriate Anagrams, is a good illustration of this type of word play.

If you are a devotee of anagrams, you are in good company: Queen Victoria, for instance, was very fond of them. Here is one teaser which was said to have stumped her. Rearrange the letters 'ABONETY' into a seven-letter word (this may not be as easy as it at first appears). See how quickly you are able to come up with the correct solution (see A141).

*10

Appropriate Anagrams

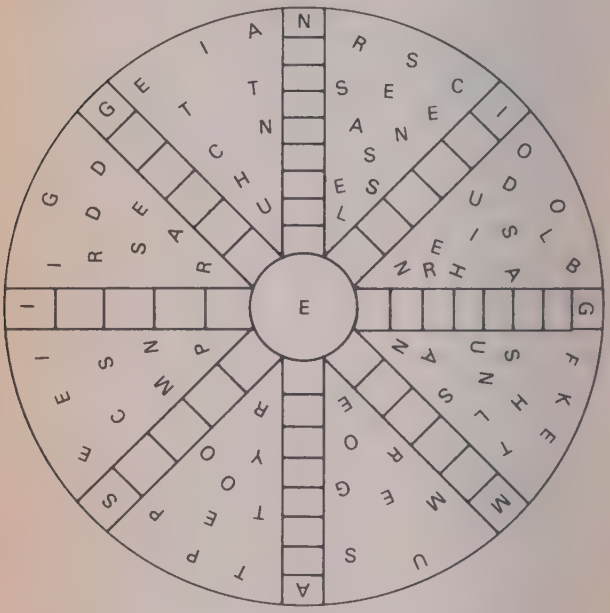
All the solutions to the following have some relationship with the original.

1. They see (3, 4)
2. Truss neatly to be safe (6, 4, 4, 5)
3. Bear hit den (10)
4. I batch words (11)
5. Sear sad earth (6, 6)
6. Many a sad heart can whisper my prayer (1, 5, 9, 3, 1, 5, 3, 4)
7. HMS Pinafore (4, 3, 4)
8. I love Ms Nude (5, 2, 4)

(*See A61*)

Enigmasig 1

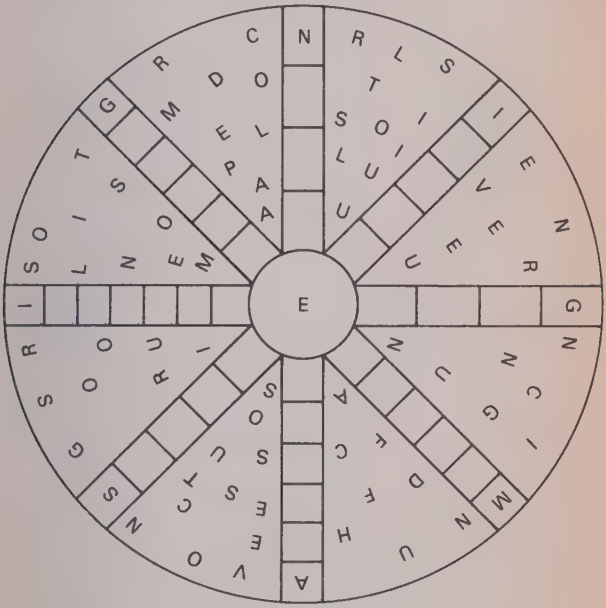
Complete the words in each column, all of which end in 'E'. The scrambled letters in the section to the right of each column are an anagram of a word which will give you a clue to the word you are trying to find to put in the column.



(*See A16*)

Enigmasig 2

Complete the words in each column, all of which end in 'E'. The scrambled letters in the section to the right of each column are an anagram of a word which will give you a clue to the word you are trying to find to put in the column.



(*See A20*)

***13

Anagram Themes

In each set below arrange the 14 words in pairs so that each pair is an anagram of another word or name. The seven words produced will have a linking theme. For example, if the words 'DIAL' and 'THAN' were in the list they could be paired to form an anagram of 'THAILAND', the theme being countries.

(a)
BE
COIN
HE
HOLD
LAW
NEAT
PAD
PIN
RATE
RAVE
ROLE
RUM
TASK
UPPER

(*See A119*)

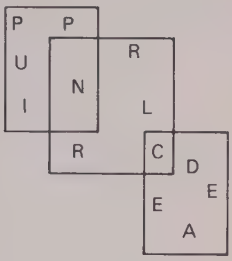
(b)
AGE
FEAR
GILD
HAND
MAID
MAT
MORE
NO
RAN
RIG
RUN
SHOWING
SON
TAN

(*See A80*)

*14
No Neighbours

In each of the following unscramble the letters to find a word. There are no two adjoining letters in the same shape.

(a) 13-letter word

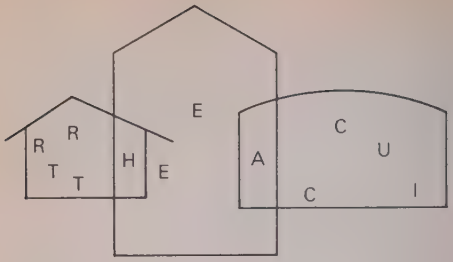


(*See A57*)

(b) 11-letter word

(*See AIII*)

(c) 12-letter word



(*See A93*)

**15
Anagrammed Synonyms

In each of the following study the three words given. Your task is to pair two of them to form an anagram of a word which is a synonym of the word remaining.

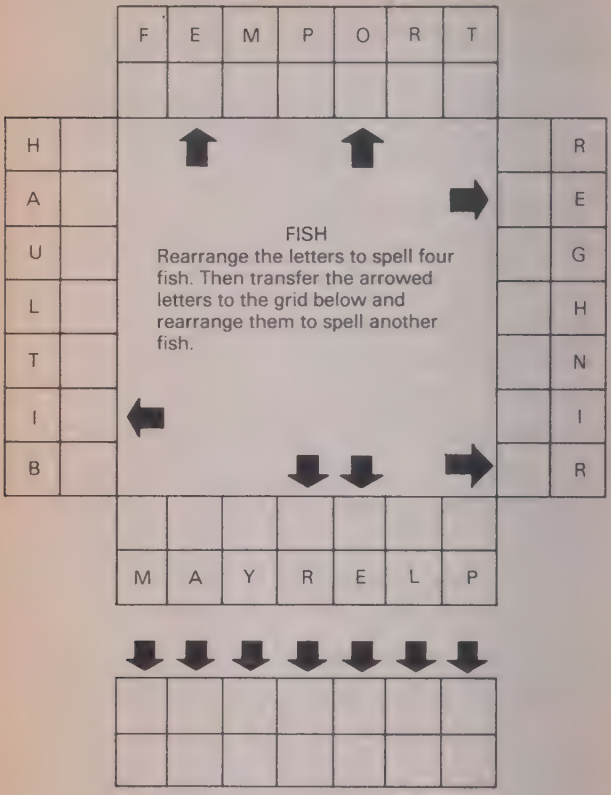
For example: DEED – EMPTY – REST. The words 'DEED' and 'REST' are an anagram of 'DESERTED', which is a synonym of the remaining word, 'EMPTY'.

1. OPEN – APRON – FAIR
2. WHEEL – SEER – OUT
3. CALL – MAIL – CROP
4. MAR – SEND – STINT
5. TAME – PEER – SOAK
6. MET – SOBER – REPEAT
7. LEG – MEEK – NET
8. CASE – LATE – DEED
9. GAIN – BEAD – WIT
10. SAND – DART – PAR
11. CUR – HEAD – MAIN
12. HOP – CUP – TRY
13. SMELL – LONE – CREED
14. SAD – PEACE – LARK

(*See A31*)

*16

Enigmagram



FISH

Rearrange the letters to spell four fish. Then transfer the arrowed letters to the grid below and rearrange them to spell another fish.

(*See A114*)

Numbers can be challenging, fascinating, confusing and frustrating, but once you have developed an interest in them, a whole new world is opened up as you discover their many characteristics and patterns. Numbers can be divided into many different categories: a few of these which we would like to expound on are amicable, abundant, deficient, perfect and delectable numbers.

Amicable numbers are pairs which are mutually equal to the sum of all their aliquot parts: for example, 220 and 284. The aliquot parts of 220 are 1, 2, 4, 5, 10, 11, 20, 22, 44, 55 and 110, the sum of which is 284, while the aliquot parts of 284 are 1, 2, 4, 71 and 142, the sum of which is 220. There are seven known pairs of amicable numbers, the largest of which are 9,437,056 and 7,363,584.

Abundant, deficient and perfect numbers can be linked together as every number is one of these. An abundant number is one such that the sum of all its divisors (except itself) is greater than the number itself: for example, 12, because its divisors, 1, 2, 3, 4 and 6, total 16. The opposite of this is a deficient number, where the divisors total less than the number itself: for example, 10, whose divisors, 1, 2 and 5, total 8. If a number is not abundant or deficient, then it must be perfect, which means that it is equal to the sum of its aliquot parts: for example, 6, where its divisors, 1, 2, 3, also total 6. Perfect numbers were first named in Ancient Greece by the Pythagoreans around 500 BC and to date only 30 have been discovered. The first four perfect numbers were discovered before AD 100 and these are 6, 28, 496 and 8128. However, the next was not found until the fifteenth century; it is 33,550,336. With the help of computer technology the process of discovering new perfect numbers has been speeded up and the latest to be found has no fewer than 240 digits. One fact that has emerged is that all the perfect numbers now known are even numbers. However, no one from the time of Euclid to the present day has been able to prove that it is mathematically impossible for a perfect odd number to exist.

So, having dealt with amicable, abundant, deficient and perfect numbers, what, may you ask, is a delectable number? The answer is that a nine-digit number is delectable if (a) it contains the digits 1 to 9 exactly once each (no zero) and (b) the numbers created by

taking the first n digits (n runs from 1 to 9) are each divisible by n, so the first digit is divisible by 1 (it always will be), the first two digits form a number divisible by 2, the first three digits form a number divisible by 3, and so on. It is known that there is one, and only one, number which meets the above conditions and can be called a delectable number. Can you find out what it is? (See A142.)

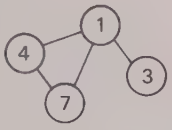
***17

Connections

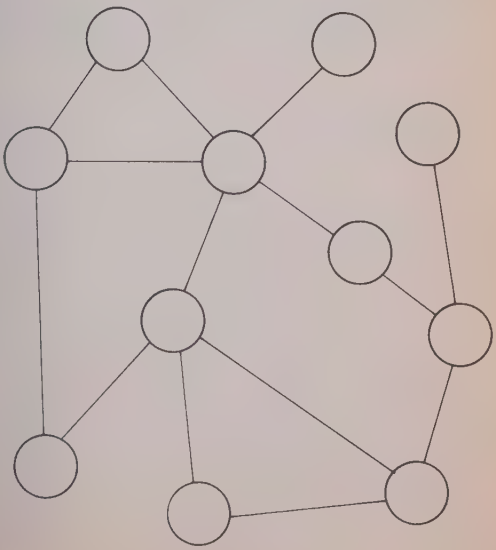
Insert the numbers 0 to 10 in the circles, so that for any particular circle the sum of the numbers in the circles connected directly to it equals the value corresponding to the number in that circle as given in the list below.

For example:

1 = 14 (4 + 7 + 3)
4 = 8 (7 + 1)
7 = 5 (4 + 1)
3 = 1



0 = 13
1 = 8
2 = 11
3 = 15
4 = 8
5 = 25
6 = 7
7 = 20
8 = 20
9 = 12
10 = 0



(*See A54*)

*18
Average Speed

A car travels at a speed of 50 m.p.h. over a certain distance and then returns over the same distance at a speed of 30 m.p.h. What is the average speed for the total journey?

(*See A88*)

*19
Train

A train travelling at a speed of 50 m.p.h. enters a tunnel which is 1½ miles long. The length of the train is ¼ mile. How long does it take for all of the train to pass through the tunnel, from the moment the front enters to the moment the rear emerges?

(*See A100*)

(a) Arrange the digits 1 to 9 once each only to form a single fraction that equals one eighth.

(*See A37*)

(b) Arrange the digits 1 to 9 once each only to form a single fraction that equals one seventh.

(*See A4*)

(c) Arrange the digits 1 to 9 once each only to form a single fraction that equals one sixth.

(*See A101*)

(d) Arrange the digits 1 to 9 once each only to form a single fraction that equals one half.

(*See A9*)

**21
Horse Racing

4.00 Everingham Maiden Stakes

1.	Anfield's Star	5–2
2.	Fresh from Victory	7–2
3.	James Star	9–2
4.	King of Sailors	5–1
5.	Lapiaffe	10–1
6.	Mariner's Law	16–1
7.	Turture	20–1
8.	Dayadari	?

What odds should the bookmaker give against Dayadari to give himself a 10 per cent margin on the race, assuming he balanced his books?

(*See A21*)

***22
Lathe

A lathe turner reduced the time taken to process a metal part from 35 minutes to 2½ minutes. He increased his cutting speed by 1690 inches per minute. To how much?

(*See A13*)

***23
Coin

Three men, A, B and C, toss a coin in succession. The winner will be the first to throw a head. What are their respective chances?

(*See A43*)

**24
Dice

How many times on average must an ordinary six-sided die be tossed before every number from 1 to 6 comes up at least once?

(*See A1*)

**25
Numbers

What is the missing number in this list?

1, 64, 125, 216, 729, 13824, 15625, ?, 132651

(*See A81*)

**26

Square Numbers

Each horizontal and vertical line contains the digits of a four-figure square number. The digits are always in the right order, but not necessarily adjacent. Each digit is used once only, and they are all used. Find the 16 four-figure square numbers.

4	1	6	7	4	8	9	9
2	1	5	2	4	2	5	3
9	1	4	9	7	5	6	1
2	5	8	2	6	0	9	2
1	3	6	9	6	9	6	9
6	5	3	2	2	2	0	9
4	6	2	2	4	5	4	4
3	1	1	1	3	9	6	9

(*See A137*)

*27
Cinderella

Cinderella has 89 buttons. There are six lots – 5–6–12–14–23–29 – each a different shade but only two colours – red and blue. The ugly sisters took away one lot, leaving twice as many reds as blues. Which lot was taken?

(*See A40*)

**28
Series

What is the missing number in this series?

1, 81, 2025, 3025, 9801, 88209, ?, 998001, 4941729

(*See A25*)

***29
Spot on the Table

A boy, recently home from school, wished to give his father an exhibition of his precocity. He pushed a large circular table into the corner of the room, so that it touched both walls, and he then pointed to a spot of ink on the extreme edge.

'Here is a little puzzle for you, pater,' said the youth. 'That spot is exactly 8 inches from one wall and 9 inches from the other. Can you tell me the diameter of the table without measuring it?'

The boy was overheard to tell a friend, 'It fairly beat the guv-'nor', but his father is known to have remarked to a City acquaintance that he solved the thing in his head in a minute. I often wonder which spoke the truth.

(*See A103*)

*30
Handshakes

If 20 people, on parting, all shake hands with each other once, how many handshakes will there be altogether?

(*See A59*)

**31
Odd Number

Select two positive integers at random, A + D, such that A < D. Select two more positive integers at random, B + C, such that A < B < C < D.

For example: 68 – 187 – 1667 – 2095

Are the chances that B + C = an odd number:

50 per cent?

less than 50 per cent?

more than 50 per cent?

(*See A3*)

***32
Look Alike

Find the smallest possible number which when multiplied by 29 looks the same as it did before, but with the addition of the same digit on each end.

For example: ABC × 29 = YABCY

(*See A34*)

It is often said that to have a mastery of words is to have in one's possession the ability to produce order out of chaos and that command of vocabulary is a true measure of intelligence. As such, vocabulary tests are widely used in intelligence testing.

Here are a few examples of word play for you to try before tackling the rest of our word puzzles in this section (for the answers see A143).

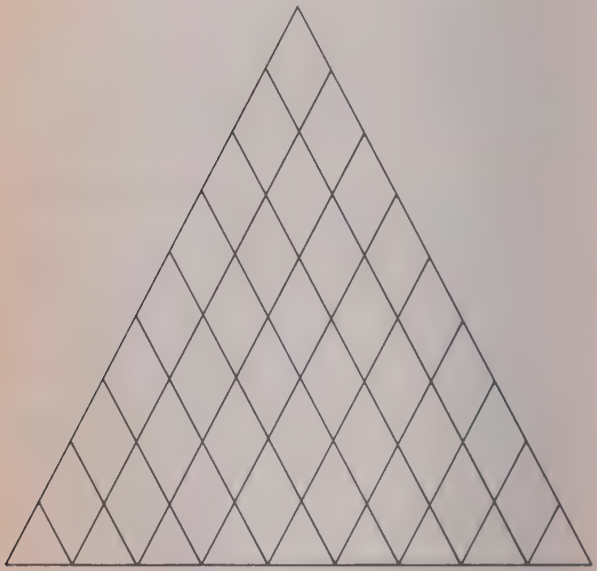
Find in the English language:

1. A word which, without a change in pronunciation, has two directly contrary meanings;
2. A seven-letter word which contains each of the five vowels once;
3. An 11-letter word whose odd letters spell out a word and whose even letters spell out a word;
4. A nine-letter word which is an anagram of a state of the USA;
5. The only word to have the letters 'UFA' embedded in it;
6. A word having five consecutive vowels embedded in it;
7. Two words which are synonyms when used as verbs but antonyms when used as adjectives, adverbs or nouns;
8. The longest word which can be typed on the top row of a typewriter.

**33
Pyramid

Using the following letters only, fill in the pyramid so that each horizontal line forms a word. Use each letter as many times as necessary. Each word formed must consist of the same letters as the word above it, in any order, plus one additional letter.

A, E, L, N, R, S, T



nine-letter word base

(*See A94*)

*34
Something in Common

What do the following words have in common?

HONOUR
CHEQUE
THEATRE
LICENCE
CENTRE

(*See A92*)

***35
Alphabet

Use the 26 letters of the alphabet once each to complete these words.

ABCDEFGHIJKLM
NOPQRSTUVWXYZ

1. D – – –
2. – O – E
3. – A L – R –
4. H A – E
5. – U – – A –
6. – A –
7. – U A – –
8. – O –
9. – A – – A
10. – O – –

(*See A86*)

36
Square Words

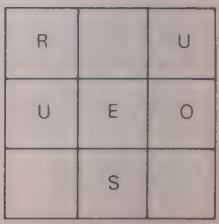
Spiral clockwise round the perimeter and finish at the centre square to spell out the nine-letter words. Each word commences at one of the four corner squares.

* (a) (*See A10*)

** (b) (*See A83*)

* (c) (*See A91*)

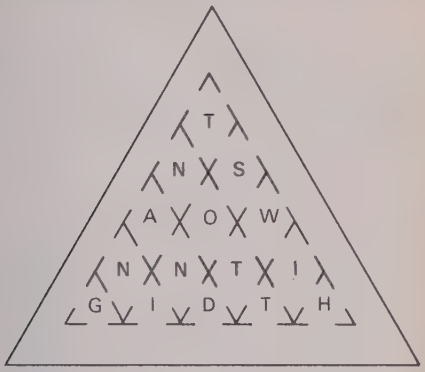
* (d) (*See A35*)



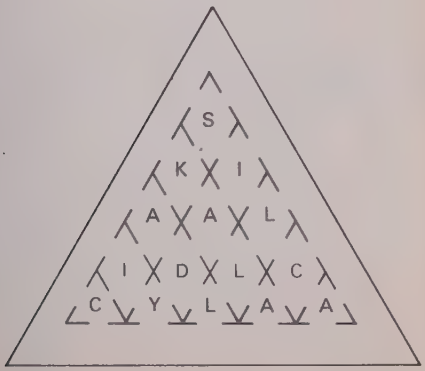
** (e) (*See A12*)

37
Labyrinth

In each of the following spell out the 15-letter word by going through the labyrinth one room at a time. Go into each room once only. You may go into the corridor as many times as you wish.



** (a) (*See A117*)



*** (b) (*See A14*)

**38

Word Construction

Use all the 30 small words scattered below once each only to construct 10 words (three small words per word).

DANCE

FACT

DAM ONE

HER EGO MALE

LOP HE

TO ABLE

HABIT

RISE

WOE FAT

CAT

FEAT IN

HER

OR EVE

RED

ANT

LESS

AGE

AT

GET

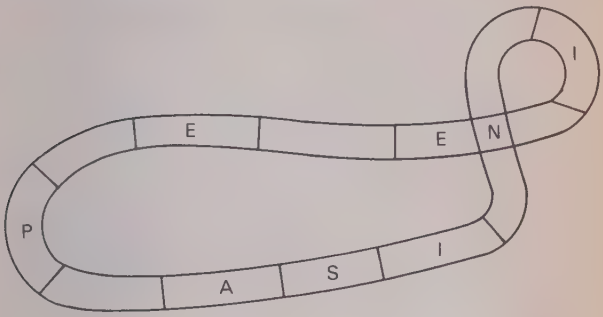
BEG

TEN

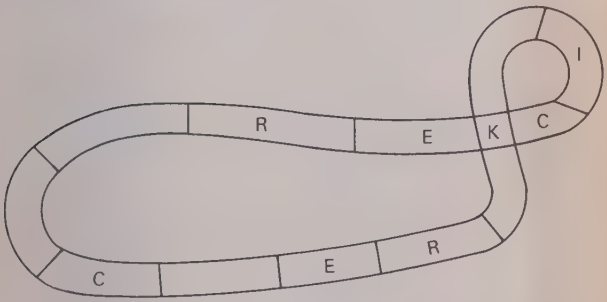
RED

(*See A136*)

Fill in the spaces to find the words. All letters are in the correct order and the overlapping letter appears twice. The word might appear reading clockwise or anticlockwise.



** (a) 15-letter word (*See A99*)



** (b) 14-letter word (*See A53*)

**40

Cryptic Elimination 1

Each clue is solved by joining together two words from the 25 listed. You will use 24 words. Find the odd word left over.

A. Does this recluse use a gin in his grounds?

B. Thigh-slapping transvestite.

C. In charge of the road works.

D. 12 makeshift people who are biased.

E. Does this marauder of the deep like the sun?

F. Charge for the cutlery and get the bird.

G. Difficult to get Jackson out unless the bowler is Hadrian.

H. Hire the knight, the price looks good.

I. This bird will do well in the marathon.

J. Sounds like an irritable monster.

K. Russian sea-faring lepidopterist.

L. Put the government away for the duration.

1. Admiral
2. Basking
3. Bill
4. Boy
5. Cabinet
6. Dragon
7. Drill
8. Filing
9. Free
10. Jury
11. Lance
12. Monk
13. Principal
14. Red
15. Rigged
16. Road
17. Runner
18. Sergeant
19. Shark
20. Snap
21. Spoon
22. Squash
23. Stone
24. Trappist
25. Wall

(*See A33*)

*41

Cryptic Elimination 2

Each clue is solved by joining together two words from the 25 listed. You will use 24 words. Find the odd word left over.

A. A bird for the winter season.

B. A simple movement in dancing.

C. Furry creature with a ringer? No, it's a plant.

D. You would expect to see the bird flying.

E. This mammal could mean murder.

F. Starting point for a race on board ship.

G. Hat worn when hunting animals.

H. Stuck up! Should try eating sweets properly.

I. Opposite of open-handed.

J. It may bounce in the post office.

K. Rapid writing system for 5-foot worker.

L. Female advertising executive in orbit.

1. Bell
2. Deer
3. Fisted
4. Goose
5. Hand
6. Hare
7. Jay
8. Killer
9. Line
10. Nosed
11. Plimsoll
12. Rubber
13. Short
14. Side
15. Silver
16. Snow
17. Space
18. Stalker
19. Stamp
20. Step
21. Tight
22. Toffee
23. Walking
24. Whale
25. Woman

(*See A19*)

*42
Fours

Place a four-letter word in the centre so that when added on to the end of the first four-letter word it will produce an eight-letter word, and when placed in front of the second four-letter word it will produce another eight-letter word.

1. WORM ---- AWAY
2. FOLK ---- BIRD
3. BACK ---- ROOM
4. CLUB ---- BALL
5. TURN ---- LAND
6. FORE ---- PLAY
7. DOWN ---- SIDE
8. WOOD ---- MILL
9. GOLD ---- HOUR
10. TYPE ---- LIFT

(*See A116*)

**43
Pair Words

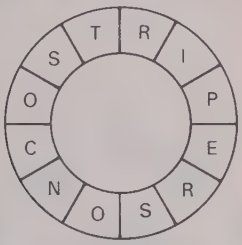
Here are two lists of words. Each word in List A has two possible pair words in List B. Each word in List B has two possible pair words in List A. There are two possible solutions. Pair a word from each list until you have eight pairs.

List A		*List B*	
NUPTIALS	MAIDEN	RING	WEDDING
SOLE	TOREADOR	HORSE	MATADOR
BULL	SEA	SEVILLE	LEMON
DIAMOND	ORANGE	SWORDFISH	NUBILE

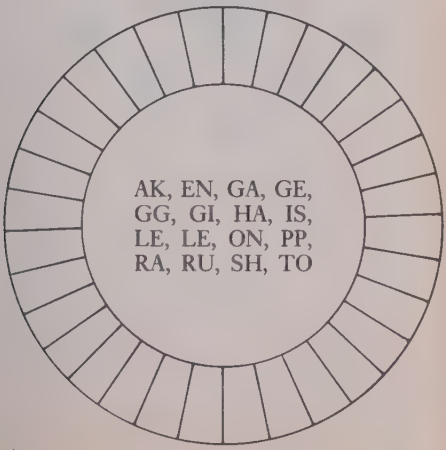
(*See A11*)

**44
Word Circle

In the example a circle of three six-letter words – oncost, stripe and person – each overlap by two letters. Each word is divided into two-letter groups and these two-letter groups from the circle are arranged in alphabetical order, that is, CO, ON, PE, RI, RS, ST.



Now try to unscramble the following to find a circle of eight six-letter words, each word overlapping its neighbour by two letters.

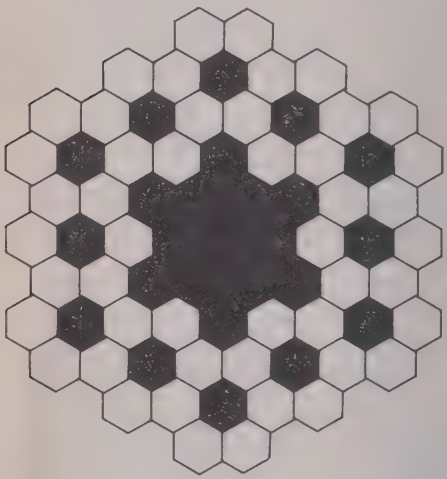


(*See A104*)

*** 45
Hexwords

Fit the words into the six spaces around each black centre, either clockwise or anticlockwise, so that all the words link up.

TYPING	BOVINE	PANDER
GROVES	GINGER	NINETY
SEVENS	PASSES	SPACES
SEDANS	COBALT	LANDED



(*See A22*)

***46

Pathway

Find seven words each commencing with the central letter 'K'. Words are in adjacent squares in any direction and each letter is used once only.

O	O	S	L	T	B	U
A	R	S	E	T	B	T
G	N	A	E	I	N	Z
E	R	I	**K**	I	K	A
H	N	O	A	I	O	J
S	G	L	R	E	B	U
I	F	N	I	Z	T	I

(*See A60*)

DIAGRAMS

The puzzles here are not tests of numeracy or literacy but concern diagrammatic representation. Widely used in intelligence testing, diagrammatic tests are considered to be culture-fair and test raw intelligence without the influence of prior knowledge. They will probe your understanding of space relationships, pattern and design. At first some of these puzzles may appear daunting, but our advice is to stick at them, because after careful study the solution may suddenly appear to you. As with all the puzzles in this book, please do not rush to look up the answer if you cannot see a solution immediately. Remember that a puzzle which baffles you initially may suddenly seem soluble if you take a fresh look some time later. Puzzles, to a great extent, are like problems in life: they often need to be worked at and thought about before the reward of a successful solution is obtained.

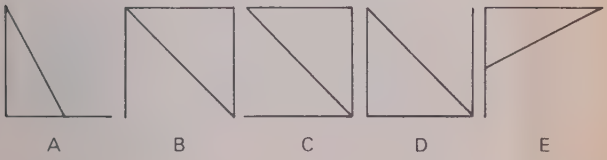
**47
Logic

Which of the following continues the above sequence?

(*See A132*)

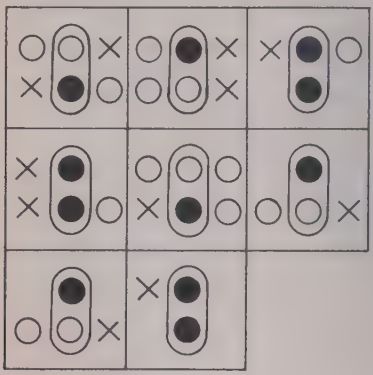
*48
Odd One Out

Which of the following is the odd one out?

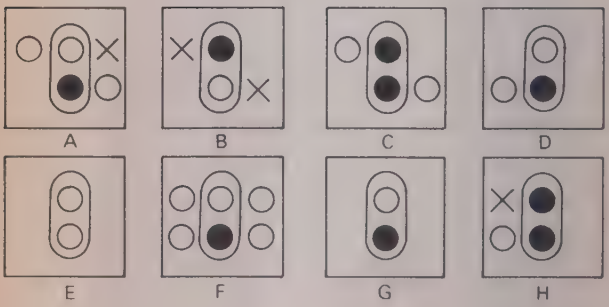


(*See A8*)

Look along each line horizontally and then down each line vertically to find what, logically, should be in the missing square.

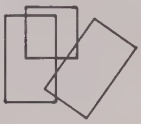


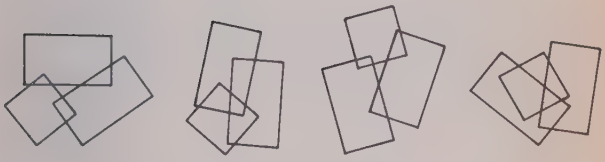
Choose from:



(*See A89*)

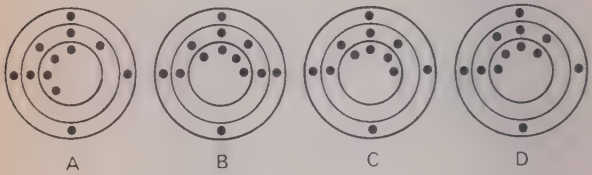
Study the three rectangles below. Which one of the options given has the most in common with them?





(*See A78*)

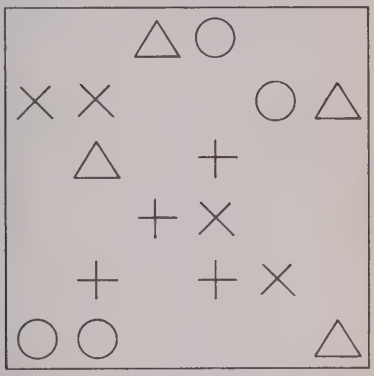
Which of the following continues the above sequence?



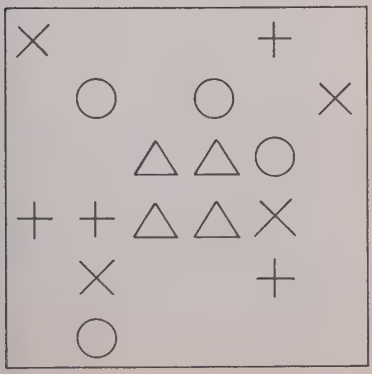
(*See A36*)

*52
Squares

In both of the following divide the squares into four parts of equal size and shape in such a way that each shape includes one of each of the four symbols.



(a) (*See A85*)

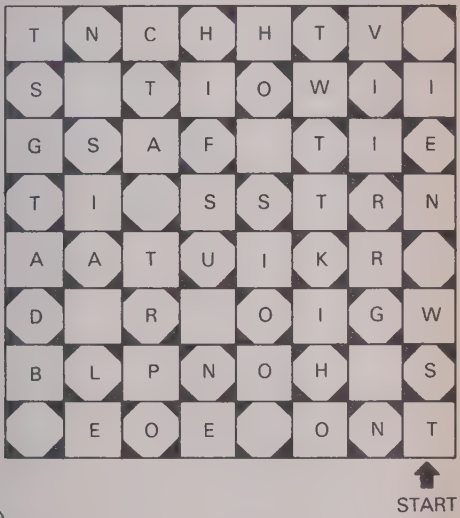


(b) (*See A32*)

For us one of the joys in compiling puzzles is to root out good quotations, and you will find several sprinkled throughout this book. We find that quotations can be thought-provoking, appropriate and amusing and we hope that you will share our enjoyment of them.

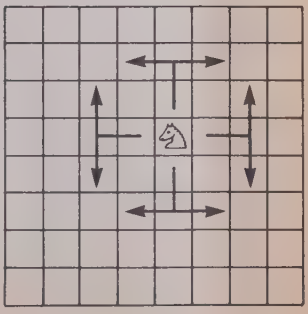
Knight's Move

Start at the letter 'T' in the bottom right-hand corner and by Knight's moves* spell out a quotation by Blaise Pascal.



(*See A5*)

* In chess the knight is the only piece allowed to jump over other pieces. It can move one square horizontally and two vertically or two horizontally and one vertically (as in the diagram to the right). Usually represented by a horse's head, it is occasionally referred to as the horse (as in the Arabic version).



**54
Quotation Pyramid

'Let's get out of these wet clothes and into a dry martini.'

Using all 45 letters of the above quotation by Robert Benchley, complete the pyramid. Across clues are given, but in no particular order.

CLUES:

Travel

Avoided deliberately

Neuter pronoun of the third person

Military pageant

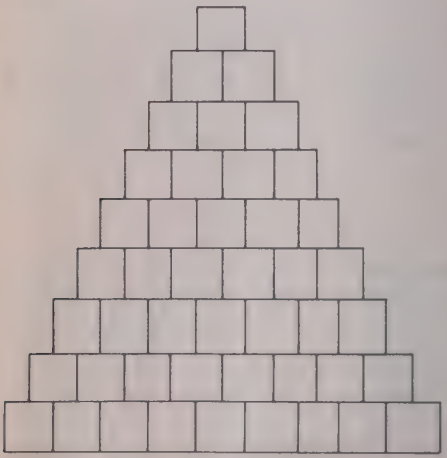
In good health

Fireproof cooking dish

Pronoun of the first person singular

Short sacred vocal composition

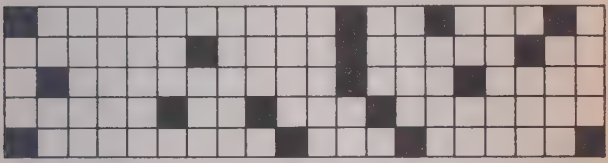
Indifferent dullness



(*See A118*)

**55
Quotation

The grid contains a quotation by Francis Bacon. The letters in the columns go into the squares above. You have to select which squares.



D	C	D	I	F	O	A	M	A	E	A	N	A	E	A	N	A	D	A	E
I	P	H	M	S	P	E	R	I	N	O	T	D	N	D	O	H	E	S	N
R	S	I	O	S	T	I	S	S	N	S		F	S	H	R	O	O	U	T
	T	O	O	U	T	R	S	T	T	Y		I	W	I	T	P	T	V	W
		R	T	Y			T			Y						S			

(*See A62*)

**56
Acrostic

Solve the clues and fill in the answers in the grid overleaf (the clues are in order). Then transfer the letters from the answers to their corresponding numbers in the square grid below it to reveal a quotation. The name of the author can be found by reading down the first vertical column of answers.

CLUES:

Cogitate

Take a piece at draughts

Shaft of wood with broad blade

Nutritious seed

Power

Avoid

Stopped ball with body

One of the three musketeers

Deep narrow gorge

One or other of two

Move tail vigorously

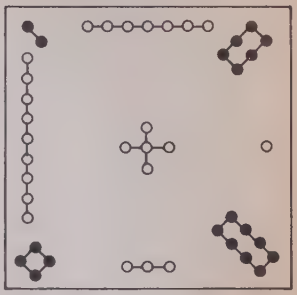
14	55	6	41	10
25	30	58	34	
50	9	18		

49	35	20	48	2	27			
23	19	36	38	29	3	42	37	56
8	15	40	12					
54	28	7	46	61	4	22		
16	33	1	57	24				
53	47	43	60	51	21			
44	11	17	32	26	45			
59	52	31	13	5	39			

	1	2	3	4		5	6	7
8		9		10	11	12	13	
14	15	16	17		18	19	20	21
22		23	24		25	26		27
28	29	30	31	32	33		34	35
36		37	38	39		40	41	42
43	44	45	46	47	48		49	50
51	52	53	54	55	56		57	58
59	60	61						

(*See A56*)

Magic number squares have intrigued mathematicians and puzzle fanatics for centuries. The first example here dates from around the beginning of the 10th century AD and is part of the Chinese Loh River scroll. Perfect magic squares must use consecutive numbers, each one only once, to produce the same total across each horizontal line, down each vertical line and from corner to corner. Not only does The Loh River 15 achieve this but, by using beads instead of written numbers, the compiler of nearly 1000 years ago has brilliantly added an additional dimension to the puzzle by showing even numbers as black and odd numbers as white.



1. The Loh River 15

Over the years magic squares have acquired a reputation for occult and mystical properties and have been inscribed on charms to ward off evil spirits and bring good luck. The real charm of these squares, however, is the seemingly endless mathematical properties which they reveal and the number of different ways which they can be constructed. We have illustrated this in Q57 with our five 5×5 magic squares puzzle.

During the seventeenth century, French mathematicians took the construction of magic squares further, and later, in the eighteenth century, the American diplomat, scientist and author Benjamin Franklin became one of the world's leading authorities on magic squares (possibly as a result of his years spent as a diplomat in Paris) and devised new types of

52	61	4	13	20	29	36	45
14	3	62	51	46	35	30	19
53	60	5	12	21	28	37	44
11	6	59	54	43	38	27	22
55	58	7	10	23	26	39	42
9	8	57	56	41	40	25	24
50	63	2	15	18	31	34	47
16	1	64	49	48	33	32	17

2. The Franklin 260

squares with intriguing patterns. In the second example here, devised by Franklin, all horizontal and vertical lines total 260, but alas, to purists it cannot be classed as a true magic square as the sums of the two corner-to-corner lines do not equal this total. However, more importantly, this square does introduce us to what is known as the property of bent diagonals and symmetrical patterns which produce the same magic total of 260. We leave you to discover as many of these patterns as you can (turn to A39 when you think you have exhausted all possibilities).

A century after Franklin, in England, another magic square guru, Dr Frierson, was able to improve The Franklin 260 by devising the mind-blowing square in the third example. Not only do all horizontal, vertical and corner-to-corner lines total 260, as demanded by the purists, but again there are many symmetrical patterns for you to discover (see A90). In addition, there is a further startling property whereby the whole divides into four 4 × 4 magic squares, each adding up to 130.

Before leaving you to tackle the kaleidoscope of magic square puzzles which follows, here are a few hints which will enable you to construct at least one magic square for every odd number from 3 × 3 upwards.

64	57	4	5	56	49	12	13
3	6	63	58	11	14	55	50
61	60	1	8	53	52	9	16
2	7	62	59	10	15	54	51
48	41	20	21	40	33	28	29
19	22	47	42	27	30	39	34
45	44	17	24	37	36	25	32
18	23	46	43	26	31	38	35

3. The Frierson 260

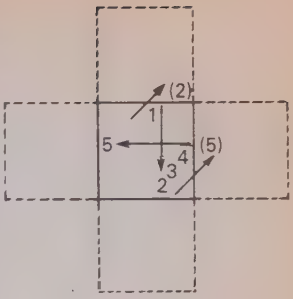
30	39	48	1	10	19	28
38	47	7	9	18	27	29
46	6	8	17	26	35	37
5	14	16	25	34	36	45
13	15	24	33	42	44	4
21	23	32	41	43	3	12
22	31	40	49	2	11	20

4. The 7 × 7 Standard 175

Taking, for example, the 7 × 7 square shown in the fourth example, the system of construction holds good for any odd number. It is simply to start at the middle square of the top row and move diagonally upwards (imagine four squares reproduced adjacent to the sides of the main square and move into them; the numbers reappear in the same position in the main square – see the fifth example on p. 61).

When you reach the top of a line, you go to the bottom of the next line to the right: for example, from 1 to 2. When you reach the end of a line, you go to the beginning of the line above; for example, from 45 to 46. When you reach the top right-hand-corner square, you go to the square below: for example, from 28 to 29. The only other move is when your upward diagonal path is blocked by another number, in which case you go to the square directly below: for example, from 35 to 36.

Easy when you know how!

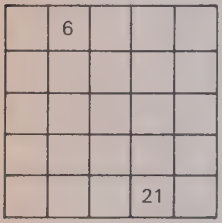


5·

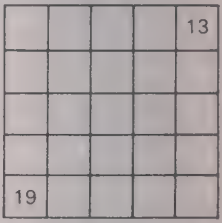
***57

Five 5 × 5 Magic Squares

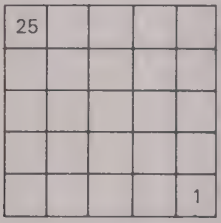
It is possible to arrange the numbers 1 to 25 in several ways to form a magic square where each horizontal, vertical and corner-to-corner line totals 65. Can you insert the numbers 1 to 25 in each of the grids below to find five different 5 × 5 magic squares? In each square two of the numbers are already positioned and your task is to insert the remaining numbers correctly.



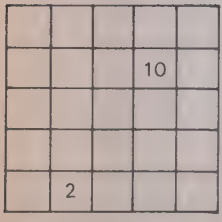
(a) (*See A6*)



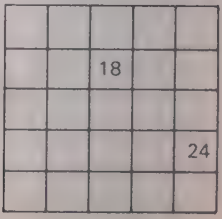
(b) (*See A112*)



(c) (*See A102*)



(d) (*See A38*)



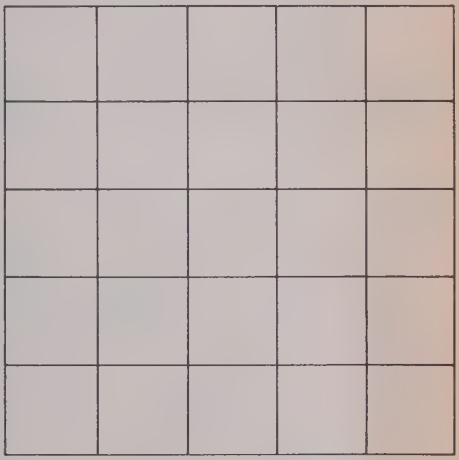
(e) (*See A67*)

**58

The Magic Nine Square

When the sum of the digits of a number will divide exactly by nine, then the number itself will also divide by nine: for example, 2673 and $2 + 6 + 7 + 3 = 18$. With this in mind, place the digits into the grid so that each horizontal, vertical and corner-to-corner line, when read both forwards and backwards, will divide exactly by nine, and also the sum of the four corner numbers will divide by nine.

1, 1, 1
2, 2, 2
3, 3
4, 4, 4, 4
5, 5, 5
6, 6, 6
7, 7, 7, 7
8, 8
9

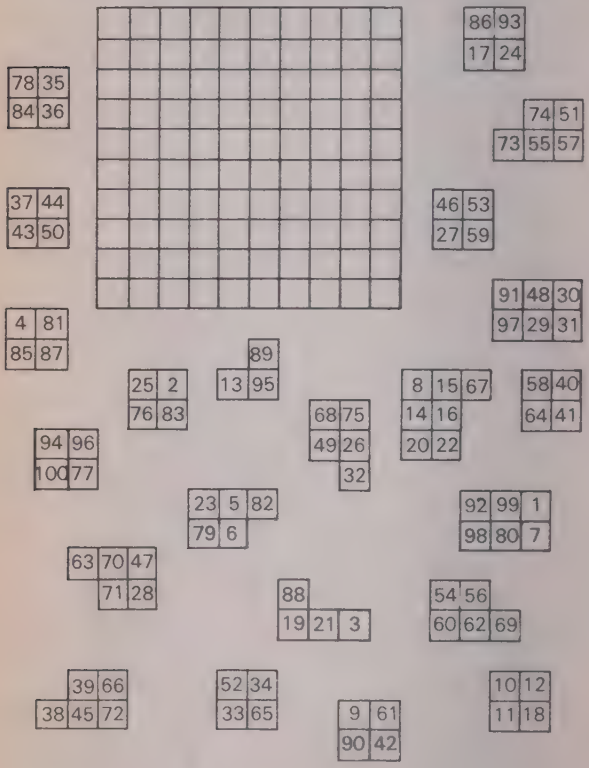


(*See A45*)

****59

Magic Square Jigsaw Puzzle

Insert the sections into the grid to form a 10 × 10 magic square so that each horizontal, vertical and corner-to-corner line totals 505.



(*See A18*)

**60

Magic Square

Fill the grid with the numbers 1 to 16 to form a magic square so that each horizontal, vertical and corner-to-corner line totals 34. One number is already inserted.

		7	

(*See A122*)

**61

The Incredible Square!

Here is a magic square in which all horizontal, vertical and corner-to-corner lines add up to 264. What is most unusual about it?

96	11	89	68
88	69	91	16
61	86	18	99
19	98	66	81

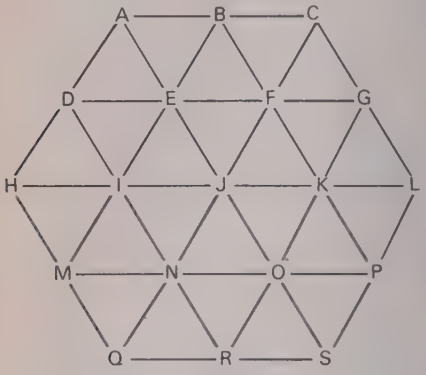
(*See A41*)

***62

Magic Hexagon

Arrange the numbers 1 to 19 so that all 15 connected straight lines (that is, horizontals and diagonals) add up to the same total.

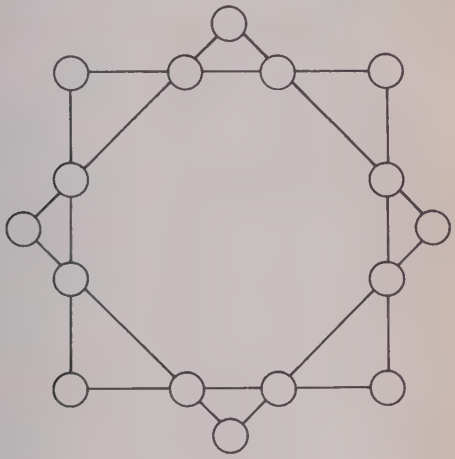
For example: A + B + C = B + E + I + M



(*See A138*)

**63
Eight-pointed Star

Distribute the numbers 1 to 16 around the nodes so that each of the eight lines adds up to the same number.

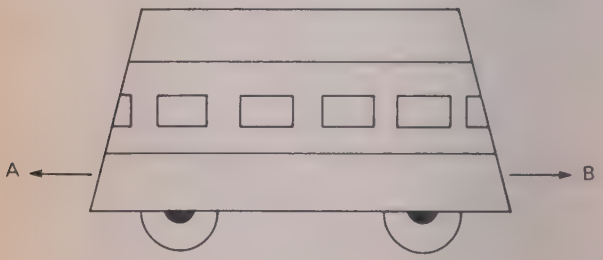


(*See A55*)

Kickself puzzles, the ones which usually have an 'obvious when you know it' answer, are well known in Mensa circles. Here are some typical examples. What was the first human artefact to break the sound barrier? (A65). Why are round manhole covers safer than square manhole covers? (A71). On a building site some workmen tell their foreman they have just found a coin marked 10 BC; why does the foreman suddenly realize they must be pulling his leg? (A75). Why are 1989 50p coins worth more than 1988 50p coins? (A87). A woman has borne just two sons, which she gave birth to on the same day at 30-minute intervals; they are identical, but not twins. What is the explanation? (A125).

Each month a kickself puzzle appears in *Mensa*, the journal of British Mensa, with a prize for the first correct solution drawn out. We are usually inundated with correct entries but occasionally one puzzle appears which seems, for whatever reason, to stump almost everyone. Before leaving you to tackle our following compilation of kickself puzzles, here is one which was solved by only a handful of people when it appeared in *Mensa* in April 1987.

In Oxford Street, London, I saw one of these new-fangled buses. One cannot tell the front from the rear and, when stationary, in which direction the bus is heading. Which way is the bus heading: A or B?



(*See A139*)

*64
Signpost

A traveller in a strange country, with no map, comes to a crossroads where a signpost has been knocked down. How can he find his way without asking anyone for directions?

(*See A7*)

**65
Unique Number

What is unique about the number 854917632?

(*See A140*)

**66
Ceremonial Sword

On Japanese trains there is a rule that forbids passengers bringing on to the train objects longer than 36 inches. How did a passenger travel with a ceremonial sword that was 42 inches long?

(*See A49*)

*67
BC/AD

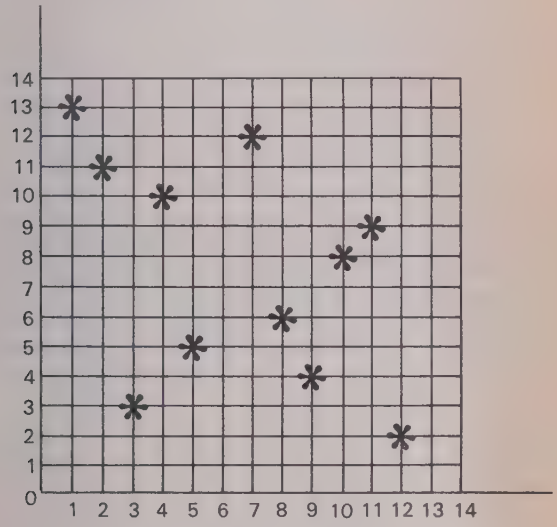
A Greek was born on the 260th day of 20 BC and died on the 260th day of AD 60. How many years did he live?

(*See A105*)

***68

Manhattan

In Manhattan the avenues run north to south and the streets run east to west. 11 friends who work at the intersection of the roads marked with an * wish to meet on a street corner with the least possible amount of total walking distance. On which corner should they meet?



(*See A15*)

***69
Water to Wine

A full cask of wine has a bung hole on the top surface. You have only a bottle full of water. Without moving the cask or damaging it, and using no other appliances, how can you obtain a bottle of wine from the cask?

(*See A131*)

**70
Pantechnicon

The driver and his pantechnicon weigh 10 tons. His cargo of 200 uncaged sleeping pigeons weighs 200 lb. The driver approaches a 10-ton-limit bridge, stops, gets out, bangs on the side of the pantechnicon to make the pigeons fly about, gets back in and drives over the bridge safely. In practice his actions were correct because he managed to cross the bridge safely, but was his reasoning correct in theory?

(*See A52*)

**71
Arabian Knight

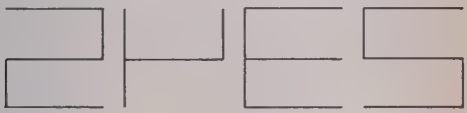
An Arab came to the riverside,
With a donkey bearing an obelisk,
But he did not venture to ford the tide,
For he had too good an *.

* What is the missing word?

(*See A64*)

*72
Series

Can you draw the next figure in this series?



(*See A29*)

**73
Lunch at the Club

Every member of the Luncheon Club is either a truther, who always tells the truth when asked a question, or a liar, who always answers with a lie. When I visited the club for the first time, I found its members, all men, seated around a large circular table, having lunch. There was no way to distinguish truthers from liars by their appearance and so I asked each man in turn which he was. This proved unenlightening. Each man naturally assured me he was a truther. I tried again, this time asking each man whether his neighbour on the left was a truther or a liar. To my surprise each told me the man on his left was a liar. Later in the day, back home and typing up my notes on the luncheon, I discovered I had forgotten to record the number of men at the table. I telephoned the club's president. He told me the number was 37. After hanging up I realized that I could not be sure of this figure because I did not know whether the president was a truther or a liar. I then telephoned the club's secretary.

'No, no,' the secretary said. 'Our president, unfortunately, is an unmitigated liar. There were actually 40 men at the table.'

Which man, if either, should I believe? Suddenly I saw a simple way to resolve the matter.

Was it 37 or 40?

(*See Ans*)

Nothing seems to grip the public's imagination more than a treasure hunt. The Klondike Gold Rush of 1896 in America was a prime example and also, more recently in England, there was the occasion when an author buried some treasure and then published a book giving cryptic clues to its location and people enthusiastically combed the countryside for days looking for it. Incidentally, the treasure was never found.

Since 1845, in America, many people have devoted a great deal of their time to trying to break what is known as the Beale Cyphers in an attempt to find the whereabouts of several tons of gold, silver and jewels supposedly buried near the town of Montvale (formally Bufords), Virginia. It was a Virginian, Thomas J. Beale, who set out with a party of men in 1817 on a hunting trip which eventually took them towards the Colorado mountains. Here they discovered gold and stayed on to mine both gold and silver for 18 months. Then in November 1819, fearing for their safety and their vast fortune, they returned to Virginia to hide their treasure in a secret excavation six feet below ground. Two years later they again returned to the site with some $13,000 in jewels, which they had purchased in St Louis. During this time Tom Beale had become acquainted with Robert Morriss, the proprietor of a hotel where he stayed, and he entrusted to Morriss a strong iron box for safekeeping. Later he wrote to Morriss, asking him to keep the box for 10 years and telling him that if he had not by then called to collect it, to open it up. Beale was never heard of again, but to be on the safe side Morriss waited for almost 25 years before finally opening the box in 1845. Inside he found several sheets of paper and letters telling the story of the treasure, together with three cryptograms, or ciphers, giving details of the location of the treasure, its contents and Beale's next of kin. One letter promised that the three ciphers could easily be cracked using a key which would be sent to Morriss, but it never arrived. As Morriss could not crack the ciphers he enlisted the help of a friend, who became obsessed with them and after some 20 years was finally able to crack one of the ciphers, the one giving the contents of the vault of treasure.

The method which he discovered Beale had used was to take the Declaration of Independence and allocate each word a number, from WHEN = 1 to HONOR = 1322, then, taking the first letter

of the word which corresponded to each number of the cipher, the message was spelt out, starting: 115(I), 73(H), 24(A), 807(V), 37(E), 52(D), 49(E), 17(P), 31(O), 62(S), 647(I), 22(T) ...

Since then, the remaining two ciphers have remained a mystery, despite many thousands of hours of research and effort, and no treasure has been found. Whether the Beale treasure is genuine or a hoax we cannot be sure, but research is still continued, especially by the members of the Beale Cypher Association in Pennsylvania.

No story could better illustrate the appeal of codes and ciphers. The handful of puzzles which follows contains some original codes and ciphers of our own invention. We cannot promise you any buried treasure, but hopefully you will spend some entertaining minutes or hours solving them, and for any that you cannot crack, at least you will not have to wait years for the answer, as all you have to do is turn to the back of the book!

*74
Carter Cipher

Decode the following:

686, 323, 311, 457, 010, 819, 001, 121, 663, 879, 324, 775, 100, 030, 777, 446, 185, 441, 239, 151, 011, 212, 010, 784, 488

(*See A127*)

***75
Coded Message

Decode the following to reveal a message:

ECHO, MOOD, LIMA, SIERRA, SOUND, PAPA, BEACH, TANGO, IDEA, WHISKY, SCREEN, QUEEN, ROMEO, MAE, WEST, CROON, CHAMPAGNE, QUEST, WROTE, FOIL, IMMORTAL, FIELDS.

(*See A63*)

*76
Cryptograms

Each cryptogram is a straight substitution code where every letter of the alphabet has been replaced by another. Each of the three is in a different code.

1. OE XYHSWSNH SN O WOE BRX NHOJHN O MJXNNBXJZ YPFFCD BSHR O IXPEHOSE YDE.

(*See A68*)

2. XNW YOH ENG DYPFWD ENWH XNPHZD ZG ETGHZ NOD XNGMZNX GA DGYWGHW NW SOH KFOYW PX GH.

– BGHWD' FOE

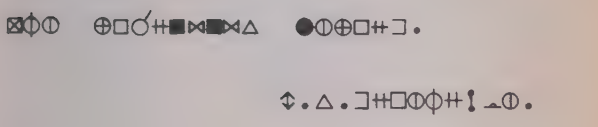
(*See A133*)

3. VT FHTHYUN, BAH UYB JQ FJXHYTDHTB IJTRVRBR VT BUCVTF UR DKIA DJTHO UR ZJRRVLNH QYJD JTH ZUYBO JQ BAH IVBVPHTR BJ FVXH BJ BAH JBAHY.

– XJNBUVYH

(*See A50*)

Decode the following:



(*See A107*)

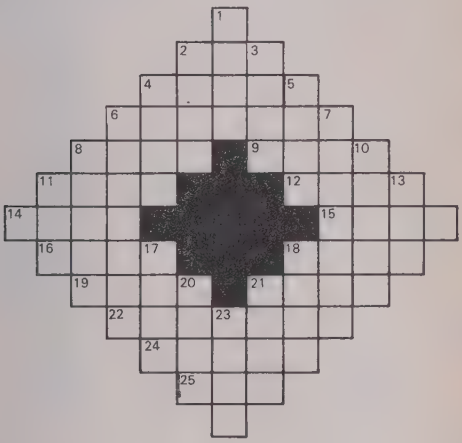
1988 was not only the year in which the 75th anniversary of the publication of the first-ever crossword puzzle was celebrated; it was also the year in which a milestone was reached for one of the authors of this book, being the 50th year after the young Kenneth Russell began his interest in compiling crosswords. As a pupil of the Strand Grammar School in Tulse Hill, south London, he was among a small group of boys who assisted the headmaster, L. S. Dawe, in compiling the *Daily Telegraph* crossword.

Some years after this, in 1945, Mr Dawe was still compiling the *Telegraph* crossword, with another group of boys, when, shortly before the D-day invasion of France by the Allies in the Second World War, he received a visit from MI5 and was detained for questioning because one edition of the newspaper contained the following crossword answers: Fido, Pluto, Omaha and Overlord. All were key code names used in the invasion plans. Mr Dawe somehow convinced MI5 that this was just coincidence. However, it was not until 1980 that the mystery was finally unravelled when a letter appeared in the *Sunday Times* from an old boy of the school who had been a member of the crossword team. He confessed to having been the culprit. It appeared that his mother had been evacuated to Lincolnshire during the war and had found work in an American Air Force base. He frequently visited her at week-ends and moved freely about the camp, where these secret code names were often bandied about. The names had stuck with him and he had, as a result, fed them into the crossword grid.

Ken's interest in crosswords has never waned since those traumatic times of half a century ago, and together we have devised the following selection of variations on the traditional crossword theme. We start with our tribute to the world's first-ever cruciverbalist (crossword constructor), Liverpool-born Arthur Wynne, whom we have to thank for his invention of 77 years ago.

*78
Wynne's Winner

The grid below is the exact design used by Arthur Wynne when he compiled the first crossword puzzle, which appeared in the *New York World* on Sunday 21 December 1913. Called a word-cross puzzle, it is reproduced here with a completely new set of clues and answers.



CLUES:

Across

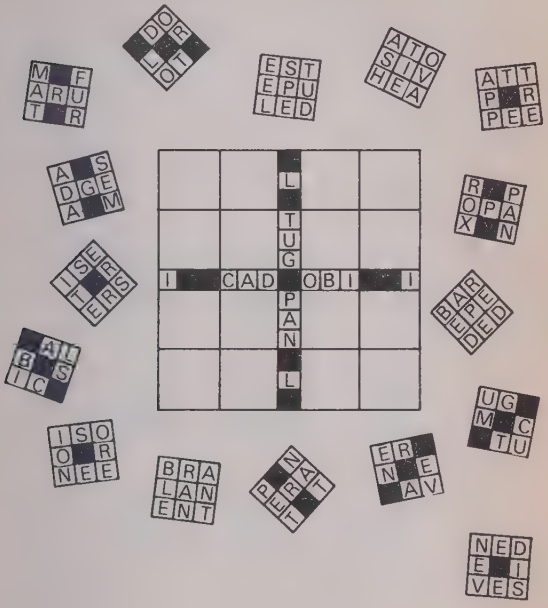
2. Piece of timber (3)
4. Passageway in theatre (5)
6. Seriously thoughtful (7)
8. Type of footwear (4)
9. Waist band (4)
11. Mild expletive (4)
12. Want (4)
14. Garrison (4)
15. Grasp (4)
16. Hard work (4)
18. Hard grating noise (4)
19. Christmas (4)
21. Eat dinner (4)
22. Closest at hand (7)
24. Rap sharply (5)
25. Large deer (3)

Down

1. Low tufted plant (4)
2. Fabric with raised nap (4)
3. Fluently insincere (4)
4. Long period of time (4)
5. Not odd (4)
6. Part of a whole (7)
7. Dignified and graceful (7)
8. Member of nobility (5)
10. Neatly brief and concise (5)
11. Small round mark (3)
13. Plunge (3)
17. National emblem of Wales (4)
18. Expose to danger (4)
20. Narrow road (4)
21. Ship's platform (4)
23. Turn over and over (4)

(*See A74*)

Place the 3 × 3 sets in the grid to complete the crossword.



(*See A77*)

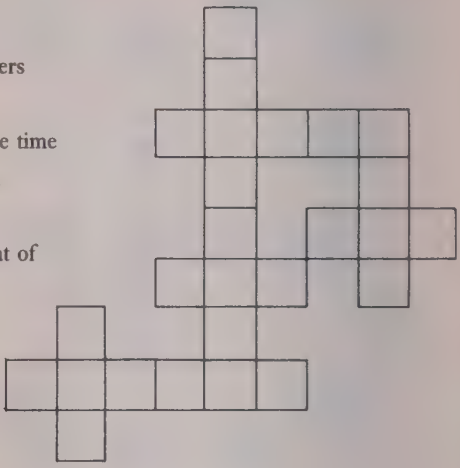
*80

Cross-Alphabet

Insert the 26 letters of the alphabet into the grid, using each one only once, to form a crossword. The clues are in no particular order.

CLUES:

Defensive players
Trot along
Behind the true time
The west wind
Exasperate
Express amount of
Indistinct



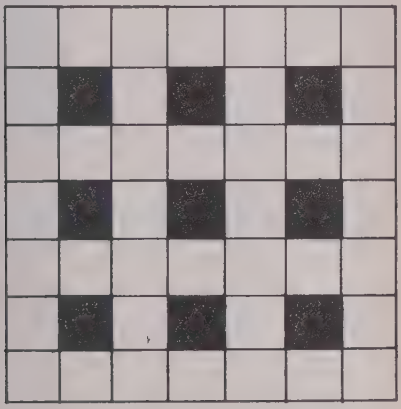
(*See A26*)

***81

Nursery Rhyme Crossword

There was a crooked man who walked a crooked mile. He found some crooked silver pieces which had fallen out of the crooked pocket of a crooked man in charge of a crooked football match by a crooked stile. With the crooked money he bought crooked mice and a crooked snake and they all lived together with twin girls in a crooked house and he puts up with the racket which sounds louder each day.

Find the eight clues, solve them and place the answers in the grid.



(*See A95*)

The answers to the clues are to be found in the grid in letter order. They are all nine-letter words. For example: Deciduous.

CLUES:

1. Shedding leaves
2. Small underground burrowing creature
3. Exaggerated statement
4. Greatness
5. Reclining
6. Trite saying
7. Narrow-minded
8. Sweetmeat
9. Simple covering for lower middle part of body

(*See A46*)

H	L	R	L	D	H	E	W	M
E	O	Y	E	I	I	A	A	I
D	I	G	R	T	C	Q	P	C
I	N	T	N	T	E	U	U	E
I	B	C	H	I	M	O	R	D
C	U	B	T	B	L	W	R	O
O	E	O	O	I	O	U	I	U
L	T	U	S	N	D	N	R	C
H	E	S	M	M	T	E	D	E

*83
'A' Frame

Each horizontal and vertical line indicates the consonants of a word which can be completed by adding a number of 'A' vowels. The two-figure number at the end of each line indicates the number of consonants and 'A' vowels: for example, 3–2 indicates three consonants and two 'A' vowels. Each letter in the grid is used once only and all letters must be used. The consonants to be used in each line are not necessarily in the correct order or adjacent.

CLUES:

Across

1. Trite
2. Hoax
3. Danger
4. Eastern native
5. Coward
6. Gather
7. Indian sailor

Down

1. Pineapple
2. Chasm
3. Certain
4. Waterway
5. Structures
6. White ball in bowls
7. Parrot

(*See A23*)

	1	2	3	4	5	6	7	
1	L	S	T	B	S	N	W	3-2
2	S	N	R	N	C	J	D	4-2
3	H	S	Z	L	D	R	C	4-2
4	B	Y	D	C	W	K	R	2-2
5	T	B	D	D	L	S	R	5-2
6	N	M	N	S	L	S	M	3-2
7	N	L	M	C	R	C	S	4-2
	3-3	4-1	4-3	3-2	4-1	3-1	3-2	

***84

Select a Crossword

Each number has a choice of possible letters, as shown in the key. Select the correct letter for each square to form eight seven-letter interlocking words.

KEY:

1	A	B	C
2	D	E	F
3	G	H	I
4	J	K	L
5	M	N	O
6	P	Q	R
7	S	T	U
8	V	W	X
9	Y	Z	

(*See A129*)

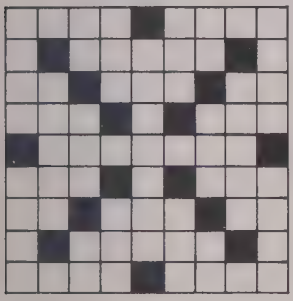
*85

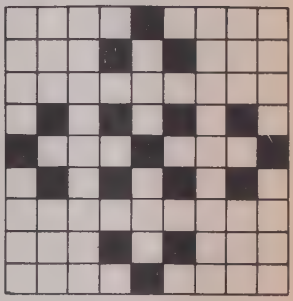
DIY Crosswords

Place all the words below into the two empty grids to form two crossword puzzles.

NO	TAP	EON	RED	BETS	TOOL
ME	SPA	NIT	APT	ACHE	ERAS
IT	SHY	ANT	YET	EVEN	EMIT
SO	LAP	ROE	ACE	WETS	SLIP
TO	PUT	LAM	MOW	KNOW	SLAP
IN	SON	TEA	TOW	AIDE	SICK
AS	BIT	HEN	SAT	PETS	EDGY
IS	TEG	GET	ART	SPEW	TOIL

MOTET	DRAUGHT	APPEALING
NOTES	EPAULET	PRESCRIBE
SEDAN		CRINOLINE
SPENT		IMPRUDENT



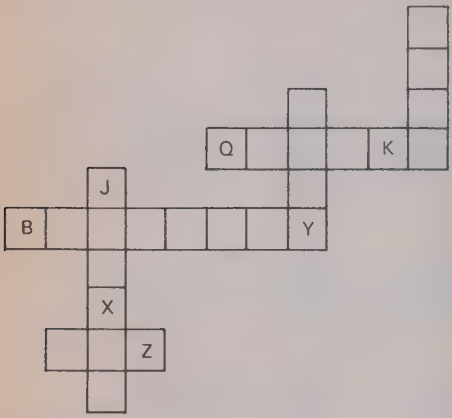


(*See A79*)

***86

Clueless Cross-Alphabet 1

Insert the 26 letters of the alphabet to complete the crossword.



Seven of the letters have already been inserted.

A	(B)	C	D	E	F	G
H	I	(J)	(K)	L	M	N
O	P	(Q)	R	S	T	U
V	W	(X)	(Y)	(Z)		

(*See A70*)

***87

Clueless Crossword

In each square there are four letters. Your task is to cross out three of each four, leaving one letter in each square, so that the crossword is made up in the usual way with good English interlocking words.

T	A	X	O	S	N	D	A	A	Q	A	R	F	D
E	C	R	A	E	P	N	C	E	B	D	O	Y	T
A	B			I	A			X	A			A	H
R	O			R	H			V	U			R	I
E	W	E	V	Z	E	A	E	U	A	G	I	Y	N
A	O	G	J	I	T	R	P	I	T	A	N	E	G
I	M			F	D			T	E			E	A
L	S			O	C			D	U			H	R
O	E	X	R	L	N	I	E	Q	E	M	X	N	T
P	J	C	B	F	E	T	L	T	L	U	B	E	D

(*See A47*)

In this section we present a diverse collection of puzzles which have just one thing in common – their high degree of difficulty.

***88

Bath

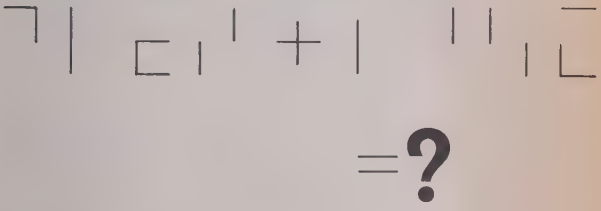
The plumber left the taps running in the bath with the plug out. The hot water tap on would fill the bath in 54 seconds. The cold water tap on would fill the bath in 48 seconds. The plug out would release a bath full of water in 30 seconds. Would the bath ever fill up?

(*See A123*)

****89

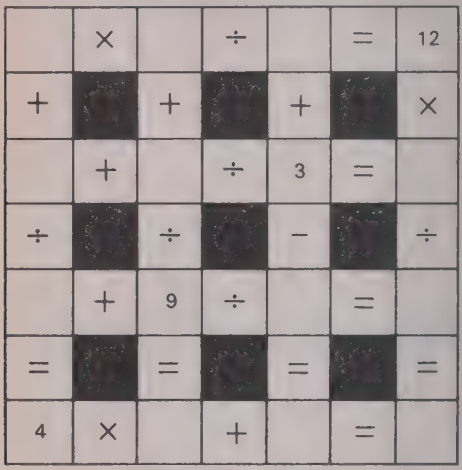
Missing Sum

The addition sum below is written out in a very unusual way. Try to work out the logic to decipher the figures and arrive at the correct answer.



(*See A106*)

Insert numbers into the remaining blank squares so that all the calculations are correct reading both across and down.



(*See A115*)

***91
Dodecahedra

I have an indefinite number of regular dodecahedra, indistinguishable in appearance from each other. I have pots of red and blue paint. If each face of each dodecahedron* is to be painted red or blue, how many dodecahedra that are distinguishable from one another shall I be able to produce?

* Dodecahedron: a solid figure having twelve plane faces.

(*See A135*)

****92
Food for Thought

When the following numbers are applied to malt

160934.4
.4046873
33.81402
2240.0

what is malt converted to?

(*See A51*)

***93
Law of the Search

Start at the top left-hand square and work from square to square horizontally, vertically or diagonally to find the 'Law of the Search'. Visit every square only once and finish at the bottom right-hand square.

T	H	H	E	L	A	A	C
F	E	T	T	S	L	Y	E
L	I	R	S	P	W	U	O
A	P	T	S	I	G	O	U
O	C	E	I	N	P	L	D
L	T	T	H	E	C	X	E
O	K	F	Y	T	T	T	O
O	O	R	A	N	I	B	E

(*See A120*)

***94
Helpuselph

A settler in the island of Helpuselph applied to the Governor for some land.

'How much would you like?' asked the Governor.

'About 100 square miles.'

'OK,' said the Governor. 'You may choose a rectangular parcel of land in the township of Little Rainfall. Its dimensions must be such that if one side of the rectangle were 5 miles longer, and the other 4 miles longer, the area of the rectangle would be twice as great, and its perimeter must be exactly 46 miles.'

The applicant duly selected and fenced his land in accordance with these conditions. But he got away with 6 square miles more than the Governor had anticipated. What was the area of the selected rectangle?

(*See A24*)

****95
Cubes

Express 100 as the sum of three cubes, allowing each cube to be positive or negative. There are only three known answers, one of which is:

$$190^3 - 161^3 - 139^3$$

Can you find the other two solutions, one with larger numbers and one with smaller numbers than the solution above?

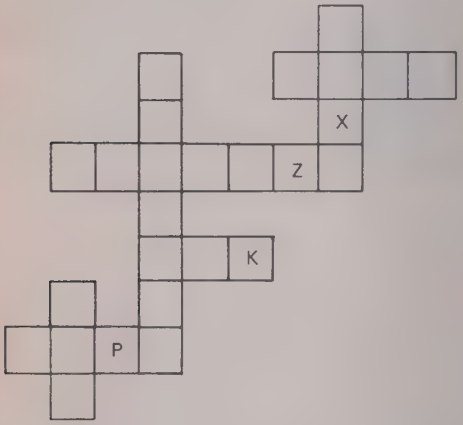
(*See A130*)

****96

Clueless Cross-Alphabet 2

Insert the 26 letters of the alphabet to complete the crossword. Four of the letters have already been inserted.

A B C D E F G H I J (K) L M
N O (P) Q R S T U V W (X) Y (Z)



(*See A121*)

***97
Triangles

The largest number of non-overlapping triangles that can be produced by drawing seven straight lines is 11. Your task below is to work out how this can be done. Three lines are already in position, showing just one triangle, and you must add a further four straight lines to the figure to produce the 11 non-overlapping triangles.

(*See A72*)

R	O	T	A	S
O	P	E	R	A
T	E	N	E	T
A	R	E	P	O
S	A	T	O	R

Magic word squares, like magic number squares, have their own special fascination. The famous example on the right is believed to have been engraved on a piece of wall plaster in Roman times and was discovered in 1868 at Cirencester, where it is now exhibited at the Corinium Museum. It is unique because the words read the same not only across and down, as with conventional magic squares, but also backwards and upwards! Never since has anyone, in any language, achieved a magic word square with these properties.

Magic word squares become progressively more difficult to compile as the number of words increases. Several 8×8 squares have been achieved and there have been many attempts at nine- and ten-letter squares but, regretfully, these have either contained words for which meanings cannot be found or repeated words and tautonyms (words consisting of repeated words: for example, Baden-Baden). So the challenge is still there to compile a nine- or ten-letter word square consisting of different words with known meanings, a challenge which was, incidentally, issued some three years ago in the British Mensa journal – but no solution was ever received.

**98

Two 5 × 5 Magic Squares

The answers to the clues, which are in no particular order, are all five-letter words. When the answers are placed in the correct position in the correct grid, two magic squares will be formed so that the same five words can be read both across and down.

CLUES:

Pendent fleshy part of soft palate

Angry

Authorized

Firm

Former gold coin of Italy

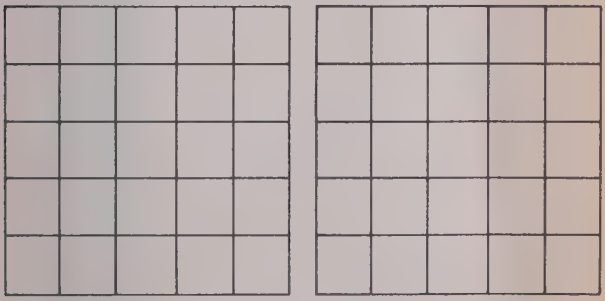
Exhilarate

Valleys

Valued

More vulgar

Work of music



(*See A109*)

**99

Two 6 × 6 Magic Squares

The answers to the clues, which are in no particular order, are all six-letter words. When the answers are placed in the correct position in the correct grid, two magic squares will be formed so that the same six words can be read both across and down.

CLUES:

Drink

Participates

Natural ability

Reach

Buy back

Strike continuously

More emotionally strained

Pared away

Develop gradually

Large piece of landed property

Disinclined

Three-legged stand

(*See A82*)

** (a) Insert the 40 letters below into the remaining spaces in the grids to form two 5 × 5 magic squares so that in each grid the same words can be read both across and down.

A, A, A, E, E, E, E, E, E, F, F, H, I, L, L, N, N, O, O, P, P, P, P, R, R, R, R, R, S, S, S, S, S, T, T, T, T, W, W

				T
			E	
		I		
	E			
T				

				F
			E	
		A		
	E			
F				

(*See A48*)

* (b) Rearrange the letters to form a magic square where the five words read the same both across and down.

T	Y	S	U	L
K	H	E	L	H
F	A	L	A	O
A	L	A	F	D
L	O	T	E	Y

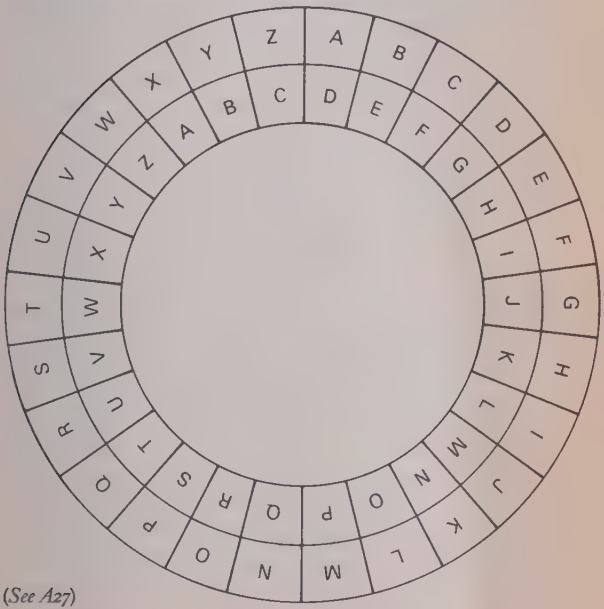
(*See A96*)

Next, when you are describing,
A shape, or sound, or tint;
Don't state the matter plainly,
But put it in a hint;
And learn to look at all things,
With a sort of mental squint.
Lewis Carroll

For our final section we have chosen another miscellany of puzzles to test and tease you. We hope you have enjoyed the selection of brainteasers that we have presented you with and that you have been successful in coming up with many of the correct solutions.

When the zoetrope* has been spun into the position below, the word 'ORB' on the outer circle gives the word 'RUE' on the inner circle: this is done by taking the letters O-R-B on the outer circle, then finding their corresponding letters, R-U-E, in the same order on the inner circle.

Using this system with the zoetrope in the same position, find another three-letter word in the outer circle which will also give a three-letter word in the inner circle. Then find a four-letter word. Then find the five-letter name of a reptile on the outer circle which spells out the name of a famous Austrian on the inner circle.



(*See A27*)

* Zoetrope: A toy with a revolving cylinder which shows a series of pictures as if the subject were alive and moving.

*102

Double Acrostic

Each couplet provides the clue to a word. Solve the clues and list the six words. Two more words will be spelt out by the first and last letters of the six words.

A tiny note, it's in quick time,
All you need to solve this rhyme?

Cry to Mark, it's so abrupt,
Delight or horror will erupt.

Set a course to steer the ship,
Plot the route when off you trip.

Just a drop to come apart,
Joy perhaps, or sad at heart?

Describe a lad who now is striving,
One day his hopes may be arriving.

Sculpture of freedom and all is well,
Here's independence and the marching bell.

(*See A58*)

**103
Early Arrival

My wife usually leaves work at 4.30 p.m., calls at the supermarket, then catches the 5 p.m. train, which arrives at our home town station at 5.30 p.m. I leave home each day, drive to the station and pick up my wife at 5.30 p.m., just as she gets off the train. One day last week my wife was able to finish work about five minutes earlier than usual, decided to go straight to the station instead of calling at the supermarket and managed to catch the 4.30 p.m. train, which arrived at our home town station at 5 p.m. Because I was not there to pick her up she began to walk home. I left home at the usual time, saw my wife walking, turned round, picked her up and drove home, arriving there 12 minutes earlier than usual. For how long did my wife walk before I picked her up?

(*See A134*)

*104
Chess Tournament

At an international chess tournament the four semi-finalists, Zena Le Vue, Dr A. Glebe, Rob E. Lumen and Ann Ziata, each represented one of four continents: Europe, Africa, the Americas and Australasia. Can you correctly match each of the four chess masters with the continent which they represented?

(*See A97*)

**105
Common Clues

What do the answers to the following clues all have in common?

Tract of waste land

Dwelling place

Place of great delight or contentment

A rule

Flake off

Ashen

A cardinal point

(*See A28*)

**106
Categorize

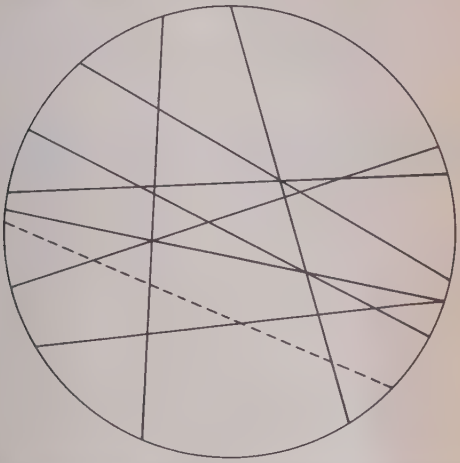
Arrange the following into groups of three:

AMITY
ASTRONOMY
CONCORD
COMET
CHEMISTRY
DOUGLAS
HARMONY
HARRIER
PEACE
PLANET
PHYSICS
STAR

(*See A76*)

*107
Colour Problem

On a map showing country boundaries, what is the least number of colours required to colour in the map so that adjoining countries have different colours?



Where countries join at a point they are not considered to be adjoining.

How many colours are required if an additional boundary (shown dotted) is added?

(*See A128*)

Find 29 names given to groups of animals, birds, fish and objects hidden in the three paragraphs.

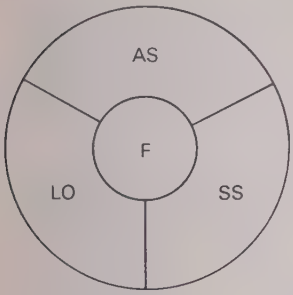
In the cove near Hove rafters tend to rake and span and slot home on buildings.

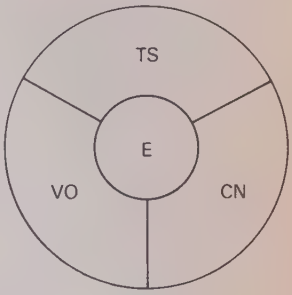
In the same cove your outer charm will be the downfall of a gang of husky gamblers.

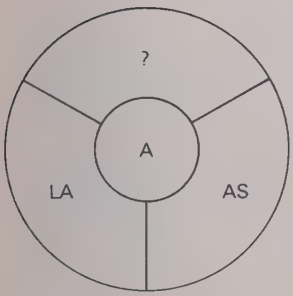
You can hear the snide remarks of a wisp of blushing kennel maids as they drift and clamour and mingle and hover and cry at the observance of a dray full of troops.

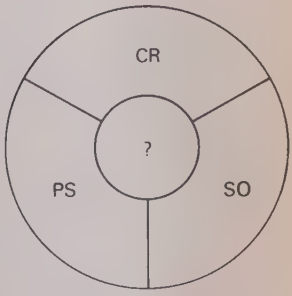
(*See A98*)

What letters should replace the question marks below?



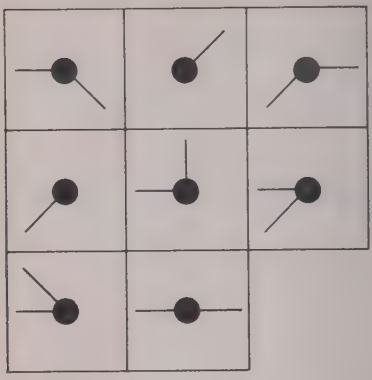




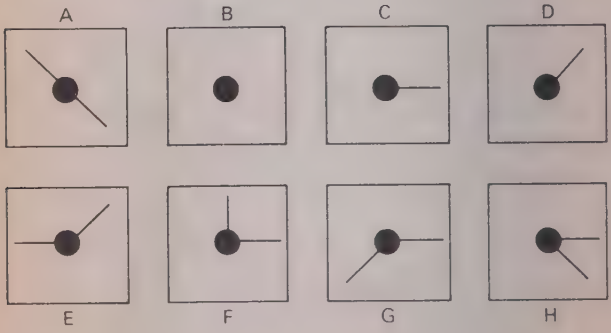


(*See A69*)

Find the missing square.



Choose from:



(*See A84*)

**111

Names Riddle

Last week it was the 70th birthday party of my uncle. It was good to meet up with some of my relatives again, particularly my brother, Bert, and sister-in-law, Lena. Auntie Tina put on a splendid buffet supper with the help of my half-cousin Flo, and at the end of the evening we had the pleasure of drinking a toast to the health of my uncle. What is his name?

(*See A124*)

****112

Coup de Grâce

Five friends, Andrew, Bernard, Claude, Donald and Eugene, each have a son and a daughter. Their families are so close that each has married his daughter to the son of one of his friends, and as a result the daughter-in-law of the father of Andrew's son-in-law is the sister-in-law of Bernard's son, and the son-in-law of the father of Claude's daughter-in-law is the brother-in-law of Donald's daughter.

But although the daughter-in-law of the father of Bernard's daughter-in-law has the same mother-in-law as the son-in-law of the father of Donald's son-in-law, the situation is simplified by the fact that no daughter-in-law is the sister-in-law of the daughter of her father-in-law. Who married Eugene's daughter?

(*See A73*)

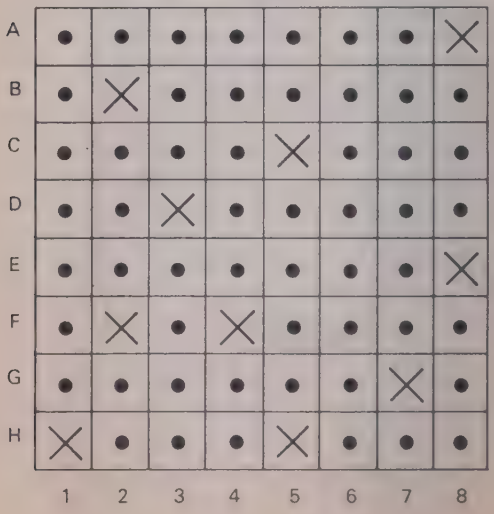
A1 (Q24) 14.7 times (the sum of 1 + 6/5 + 6/4 + 6/3 + 6/2 + 6/1)

A2 (Q8) Tabulate the results to equal 71. Only three ways are mathematically possible:
25–20–20–3–2–1
25–20–10–10–5–1
50–10–5–3–2–1
The first row is Victor's.
The third row is Madsen's; he hit the bull's-eye.

A3 (Q31) More than 50 per cent.

A4 (Q20b) 2394/16758

A5 (Q53) 'The last thing one discovers in writing a book is what to put first.' Blaise Pascal



8H–6G–4H–2G–1E–2C–1A–3B–5A–7B–8D–7F
T H E L A S T T H I N G

6H–4G–2H–1F–2D–1B–3A–5B–7A–8C–7E–8G
O N E D I S C O V E R S

6F–7H–8F–7D–8B–6A–4B–2A–1C–2E–1G–3H
I N W R I T I N G A B O

5G–6E–7C–5D–6B–4A–3C–1D–3E–5F–3G–4E
O K I S W H A T T O P U

6D–4C–5E–3F–4D–6C
T F I R S T

A6 (Q57)

23	6	19	2	15
4	12	25	8	16
10	18	1	14	22
11	24	7	20	3
17	5	13	21	9

A7 (Q64) He stands the signpost up so that the arm indicating the place he has come from is pointing in the right direction. The other arms will then point in the right directions too.

A8 (Q48) C. The others are identical pairs except that they have been rotated.

A9 (Q20d) 6729/13458

A10 (Q36a) Captivate

A11 (Q43)

Solution 1		*Solution 2*	
Orange	– Lemon	Orange	– Seville
Toreador	– Seville	Toreador	– Matador
Bull	– Matador	Bull	– Ring
Diamond	– Ring	Diamond	– Wedding
Nuptials	– Wedding	Nuptials	– Nubile
Maiden	– Nubile	Maiden	– Horse*
Sea	– Horse	Sea	– Swordfish
Sole	– Swordfish	Sole	– Lemon

* Horses which have not won a race are called maidens.

A12 (Q36e) Turquoise

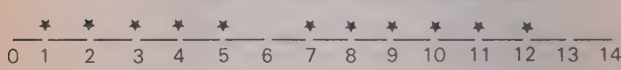
A13 (Q22) The old time is fourteen times the new, so the new velocity is fourteen times the old.

$$\frac{v}{v - 1690} = 14$$

Therefore v = 1820 inches per minute.

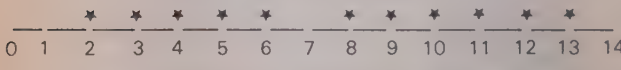
A14 (Q37b) Lackadaisically

A15 (Q68) To solve this problem, treat the avenues and streets separately. If everyone lived on the same street, the avenues would look like this:



Number 7, the middle one, would be quickest.

If they all lived on the same avenue, then the streets would look like this:



Number 8, the middle one, would be quickest.

Therefore, they would meet on avenue 7, street 8.

A16 (Q11)

Negligence	(Carelessness)
Ignoble	(Dishonourable)
Gratitude	(Thankfulness)
Macabre	(Gruesome)
Archetype	(Prototype)
Sample	(Specimen)
Ignore	(Disregard)
Genuine	(Authentic)

A17 (Q3)

Like so many puzzles of its type this looks much more complicated than it really is. In fact, it has a beautifully simple solution. The trick is first to work out how long it takes the man to walk home. You know that the dog has been running for all this time at its given constant speed, so it is then a simple matter to work out how many miles it has covered during this period.

In this case the man walks for 7 miles at 3 m.p.h., which means he takes 2⅓ hours or 2 hours 20 minutes. The dog is therefore running for 2⅓ hours at 8 m.p.h., which means it covers 18⅔ miles.

A18 (Q59)

92	99	1	8	15	67	74	51	58	40
98	80	7	14	16	73	55	57	64	41
4	81	88	20	22	54	56	63	70	47
85	87	19	21	3	60	62	69	71	28
86	93	25	2	9	61	68	75	52	34
17	24	76	83	90	42	49	26	33	65
23	5	82	89	91	48	30	32	39	66
79	6	13	95	97	29	31	38	45	72
10	12	94	96	78	35	37	44	46	53
11	18	100	77	84	36	43	50	27	59

A19 (Q41) A. Snow goose B. Sidestep C. Harebell D. Jaywalking E. Killer whale F. Plimsoll line G. Deerstalker H. Toffee-nosed I. Tightfisted J. Rubber stamp K. Shorthand L. Space woman

Odd word: Silver

A20 (Q12)

Noble	(Illustrious)
Income	(Revenue)
Guile	(Cunning)
Manacle	(Handcuff)
Avarice	(Covetousness)
Severe	(Rigorous)
Immobile	(Motionless)
Giraffe	(Camelopard)

A21 (Q21) 20–1

Odds	Odds + stake	Divide each one into 100	Staked amount	Any horse to win
2½	3½		= 28.57	100
3½	4½		= 22.22	100
4½	5½		= 18.18	100
5	6		= 16.67	100
10	11		= 9.09	100
16	17		= 5.88	100
20	21		= 4.76	100
20	21		= 4.76	100
			110.13	100

(A bookmaker tries to balance his book – that is, by giving odds lower than true odds and taking money on the horses that he wishes to. He can therefore win, whichever horse wins the race. To assess the position at any given time, he finds out how much he would have to take in order to pay £100 on the winner. If the takings are over £100 he will win; if they are under £100 he will lose.)

A22 (Q45)

A23 (Q83) *Across:* Banal, Canard, Hazard, Arab, Dastard, Amass, Lascar
Down: Ananas, Abyss, Adamant, Canal, Walls, Jack, Macaw

(L)	S	T	(B)	S	(N)	W
S	(N)	(R)	N	(C)	J	(D)
(H)	S	(Z)	L	(D)	(R)	C
(B)	Y	D	C	W	K	(R)
(T)	B	(D)	(D)	L	(S)	(R)
N	(M)	N	(S)	L	(S)	M
N	(L)	M	(C)	(R)	C	(S)

Across answers are ringed
Down answers are not ringed

A24 (Q94) The two adjacent sides of the rectangle total 23 miles. Hence, if 'm' miles be one side of the rectangle $(m + 4 \times 23 - m + 5) = 2m(23 - m)$,

so 'm' is either 14 or 8. The Governor had had in mind a rectangle 15 miles by 8 miles (which is half the area of a rectangle 20 miles by 12 miles). The applicant selected a rectangle 14 miles by 9 miles (which is half the area of a rectangle 18 miles by 14 miles). So the area in question was 126 square miles.

A25 (Q28) 494209

The sequence comprises the squares of successive Kaprekar numbers. A Kaprekar number is one which, when it is squared and when the result is divided into two sets of digits – one to the left and one to the right – produces numbers which can then be added to give the original square root. The first few Kaprekar numbers are: 1, 9, 45, 55, 99, 297, 703, 999, etc. For example:

$9^2 = 81$	$8 + 1 = 9$
$55^2 = 3025$	$30 + 25 = 55$
$297^2 = 88209$	$88 + 209 = 297$
$703^2 = 494209$	$494 + 209 = 703$

A26 (Q80) *Across:* Backs, Jog, Dim, Zephyr
Down: Quantify, Slow, Vex

A27 (Q101) Three-letter: FOB – IRE
Four-letter: CROP – FURS
Five-letter: COBRA – FREUD

A28 (Q105) They were all British Prime Ministers: Heath, Home, Eden, Law, Peel, Grey, North.

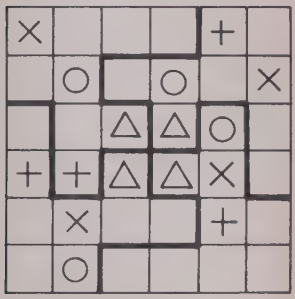
A29 (Q72) so that when viewed in a mirror the numbers 1, 2, 3, 4, 5 appear in sequence.

A30 (Q4) It is not. Consider all the mothers who have only one child. Half of the children will be boys, half girls. Mothers of the girls will then have a second child. Again there will be an even distribution of boys and girls. Half of these mothers will then go

on to have a third child and again there will be as many boys as girls. Regardless of the number of rounds and the size of the families, the sex ratio will obviously always be one to one.

A31 (Q15) 1. Apron – Pinafore 2. Out – Elsewhere 3. Call – Proclaim 4. Send – Transmit 5. Soak – Permeate 6. Sober – Temperate 7. Meek – Gentle 8. Late – Deceased 9. Wit – Badinage 10. Par – Standard 11. Head – Cranium 12. Cup – Trophy 13. Smell – Redolence 14. Lark – Escapade

A32 (Q52b)



A33 (Q40) A. Trappist monk B. Principal boy C. Drill sergeant D. Jury-rigged E. Basking shark F. Spoonbill G. Stonewall H. Freelance I. Roadrunner J. Snapdragon K. Red Admiral L. Filing cabinet

Odd word: Squash

A34 (Q32) $52631579 \times 29 = 1526315791$

A35 (Q36d) Bystander

A36 (Q51) C. In the outer circle a dot is added at 90° each time. In the middle circle the number of dots increases by one each time and the first dot moves through 90°, with the additional dots placed at 45° intervals. In the inner circle the

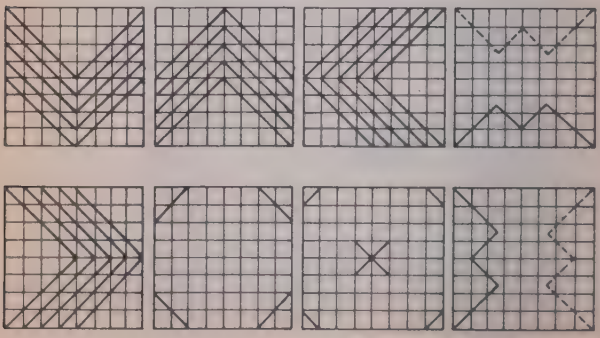
number of dots increases by one each time and the first dot moves through 45°, with the additional dots placed at 45° intervals.

A37 (Q20a) 3187/25496

A38 (Q57d)

14	3	11	13	24
19	23	7	10	6
20	15	1	17	12
4	22	25	9	5
8	2	21	16	18

A39 (Magic square introduction)



A40 (Q27) 29

When one lot was taken from a total of 89 the remainder was divisible by three. There are only four possibilities:

	A	B	C	D
Total	89	89	89	89
They took	5	14	23	29
Leaving	84	75	66	60
Red	56	50	44	40
Blue	28	25	22	20
Remaining lots	6	5	5	5
	12	6	6	6
	14	12	12	12
	23	23	14	14
	29	29	29	23

Groups must break into a 2 to 1 ratio. Only D fits:

$6 + 14 = 20$

$5 + 12 + 23 = 40$

A41 (Q61) It is still a magic square upside down and backwards.

A42 (Q5) Pyx, Myrrh, Why, Sylph, Syzygy, Rhythm, Lymph, Sly, Shyly, Shy, Slyly, Spy, Try, Ply

A43 (Q23) A = 4/7
B = 2/7
C = 1/7
(Because A goes first, he has twice the chance that B has. Because B goes second, he has twice the chance that C has – therefore 4 to 2 to 1.)

A44 (Q6) Thread The rest are all headless birds: (R)ail, (K)not, (C)row, (F)inch, (P)lover.

A45 (Q58)

5	7	3	8	4
4	1	2	9	2
6	2	5	7	7
4	1	3	6	4
8	7	5	6	1

A46 (Q82) 1. Deciduous 2. Earthworm 3. Hyperbole
4. Magnitude 5. Recumbent 6. Witticism
7. Hidebound 8. Liquorice 9. Loincloth

A47 (Q87)

C	O	N	C	E	R	T
R		I		V		R
A	V	E	R	A	G	E
M		C		D		A
P	R	E	T	E	X	T

A48 (Q100a)

S	P	O	R	T
P	A	P	E	R
O	P	I	N	E
R	E	N	E	W
T	R	E	W	S

S	T	A	F	F
T	I	L	E	R
A	L	A	T	E
F	E	T	E	S
F	R	E	S	H

A49 (Q66) He purchased a suitcase 36 in × 24 in and placed the sword in diagonally.

A50 (Q76–3) 'In general, the art of government consists in taking as much money as possible from one party of the citizens to give to the other.' Voltaire

A51 (Q92) Get out your conversion tables. Convert:

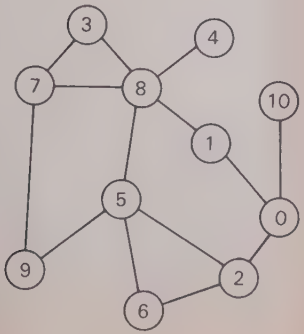
Miles to Centimetres
Acres to Hectares
Litres to Ounces
Tons to Pounds

MALT= CHOP

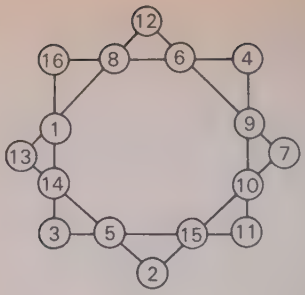
A52 (Q70) The driver's reasoning was incorrect. If the birds had flown upwards at an accelerated speed the overall weight would have decreased. If the birds had flown downward or fallen in free fall the weight would have increased. As the birds would have flown at random these two effects would have cancelled each other out and the overall weight would have remained the same.

A53 (Q39b) Knickerbockers

A54 (Q17)



A55 (Q63)



A56 (Q56)

Think
Huff
Oar
Millet
Authority
Shun
Chested
Athos
Ravine
Either
Waggle

Quotation: 'Here lies a king that ruled, as he thought fit, The universal monarchy of wit.'
Author: Thomas Carew

A57 (Q14a) Perpendicular

A58 (Q102)

M inut	E
E xclamatio	N
N avigat	E
T ea	R
A spirin	G
L ibert	Y

A59 (Q30) 190 (19 + 18 + 17 + 16 + 15 + 14 + 13 + 12 + 11 + 10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1)

A60 (Q46) Kangaroos, Kibbutz, Kinkajou, Kibitzer, Kaolin, Kingfisher, Kettles

A61 (Q10) 1. The eyes 2. Fasten your seat belts 3. Hibernated 4. Switchboard 5. Sahara Desert 6. A merry Christmas and a happy New Year 7. Name for ship 8. Venus de Milo

A62 (Q55) 'Prosperity is not without many fears and distastes; and adversity is not without comforts and hopes.' Francis Bacon

A63 (Q75) Take the letter immediately after the first vowel in each word to reveal the message: 'Come up and see me some time.'

A64 (Q71) * = asterisk (ass to risk)

A65 (Kickself introduction) The whip

A66 (Q2) They are all anagrams of American States: Maine (A mine), Oklahoma (A holm oak), Utah (A hut).

A67 (Q57e)

15	4	20	16	10
2	19	18	23	3
21	25	1	7	11
5	9	14	13	24
22	8	12	6	17

A68 (Q76–1) 'An optimist is a man who starts a crossword puzzle with a fountain pen.'

A69 (Q109) GI = Gemini W = Water
In each segment of the circle are the first and last

letters of the astrological signs surrounding the initial letter of their corresponding element.

In astrology the word triplicities is another name for the elements: Fire, Earth, Air and Water.

A70 (Q86) *Across:* Quacks, Brightly, Fez
Down: Mops, Wavy, Jinxed

A71 (Kickself introduction) They cannot fall down the hole.

A72 (Q97)

A73 (Q112) The last fact given means that no one married his son and daughter to the son and daughter of the same friend.

Let us call the five friends by their initials.

'Daughter-in-law of the father of A's son-in-law' means 'A's daughter. 'Son-in-law of the father of C's daughter-in-law' means C's son. Then A's daughter is the sister-in-law of B's son, which can only mean that her brother (A's son) married B's daughter. Similarly, C married his daughter to D's son.

Who is the husband of D's daughter? He cannot be C's or A's son. Let us suppose he is B's son. Then C's daughter's mother-in-law is Mrs

D, while A's son's mother-in-law is Mrs B. So D's daughter can't have married B's son.

It follows that D's daughter married E's son. D's daughter and B's son have a common mother-in-law: Mrs E.

Eugene's daughter is married to Bernard's son.

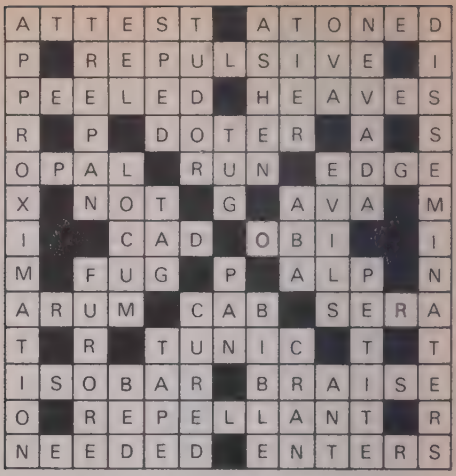
A74 (Q78) *Across:* 2. Log 4. Aisle 6. Pensive 8. Boot 9. Belt 11. Darn 12. Need 14. Fort 15. Grip 16. Toil 18. Rasp 19. Noel 21. Dine 22. Nearest 24. Knock 25. Elk

Down: 1. Moss 2. Lint 3. Glib 4. Aeon 5. Even 6. Portion 7. Elegant 8. Baron 10. Terse 11. Dot 13. Dip 17. Leek 18. Risk 20. Lane 21. Deck 23. Roll

A75 (Kickself introduction)
The coin could not have been marked BC before the birth of Christ.

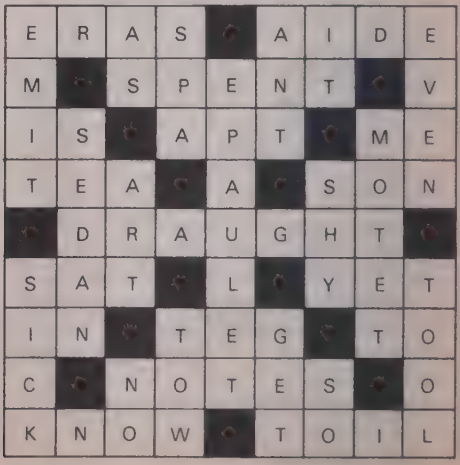
A76 (Q106) Peace, Physics, Chemistry (Nobel Prizes)
Amity, Harmony, Concord (Peace)
Douglas, Harrier, Comet (Aeroplanes)
Astronomy, Star, Planet (Astronomy)

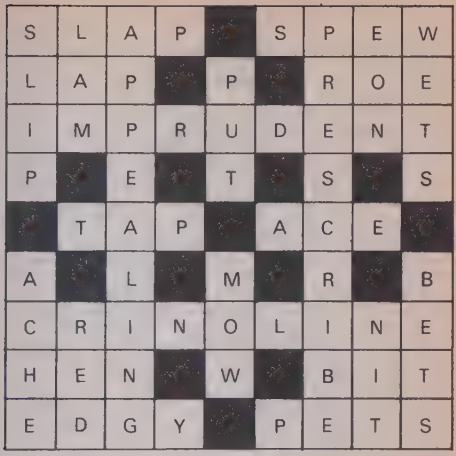
A77 (Q79)


A T T E S T A T O N E D
P R E P U L S I V E I
P E E L E D H E A V E S
R P D O T E R A S
O P A L R U N E D G E
X N O T G A V A M
I C A D O B I I
M F U G P A L P N
A R U M C A B S E R A
T R T U N I C T T
I S O B A R B R A I S E
O R E P E L L A N T R
N E E D E D E N T E R S

A78 (Q50) A. The three rectangles produce three triangles.

A79 (Q85)





A80 (Q13b) The theme is American presidents: Reagan (age ran), Garfield (gild fear), Harding (rig hand), Madison (maid son), Truman (run mat), Monroe (no more), Washington (showing tan)

A81 (Q25) 117649 (this is a list of cube numbers where either the final digit or the final two digits is their cube root: for example, $51^3 = 132651$)

A82 (Q99)

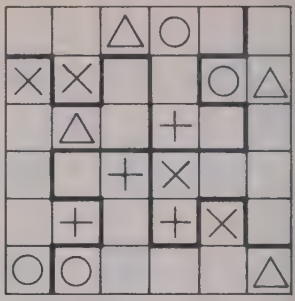
B	A	T	T	E	R
A	R	R	I	V	E
T	R	I	P	O	D
T	I	P	P	L	E
E	V	O	L	V	E
R	E	D	E	E	M

E	S	T	A	T	E
S	H	A	V	E	N
T	A	L	E	N	T
A	V	E	R	S	E
T	E	N	S	E	R
E	N	T	E	R	S

A83 (Q36b) Juxtapose

A84 (Q110) D. To spell out the word SEMAPHORE in semaphore.

A85 (Q52a)



A86 (Q35) 1. Dock 2. Hope 3. Salary 4. Haze
5. Guitar 6. Jaw 7. Qualm 8. Box
9. Fauna 10. Dove

A87 (Kickself introduction) 1989 × 50p = £994.50;
1988 × 50p = £994.00

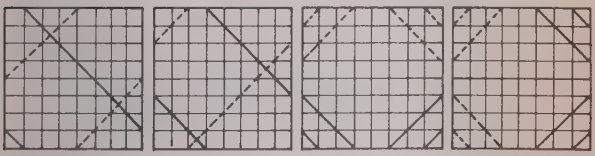
A88 (Q18) 37½ m.p.h.

If the distance to be covered is, say, 60 miles and the car is travelling at 50 m.p.h., the journey will take 1 hour 12 minutes. At 30 m.p.h. the same journey will take 2 hours. This means that it takes 3 hours 12 minutes to cover 120 miles or 1 hour to cover 37½ miles.

A89 (Q49) G.

There are two separate elements in this puzzle. Taking the black and white circles inside the enclosure, there are three different possible combinations, as indicated on p. 134, and one each of these combinations appears on each horizontal and vertical line. This is the first element of the puzzle. The second and more complex part is to work out what is happening with the 'X' and 'O' symbols outside the enclosure. The last square in each horizontal and vertical line is produced as follows: when two circles or two crosses appear in the same position in the first two parts of each line, a symbol appears in the same position in the third and final part but is changed from a circle to a cross, or vice versa. For example, looking along line one the first and second parts both contain a circle top left, so in the third part a symbol appears in the same position, but is a cross. In the same line a cross appears in the first and second parts top right, so in the third part a symbol appears in the same position, but is a circle. This procedure is repeated in each horizontal and vertical line.

A90 (Magic Square introduction)



A91 (Q36c) Kingsized

A92 (Q34) They have all different, established and accepted spellings in America: honor, check, theater, license and center. This is the result of nineteenth-century nationalism on the part of Noah Webster, of *Webster's Dictionary* fame.

A93 (Q14c) Architecture

A94 (Q33) A, AT, ATE, RATE, TREAT, RATTLE, STARLET (STARTLE), SLATTERN, TRANSLATE

Variations may be possible on the smaller words.

A95 (Q81) *Across:* Referee (in charge of a football match), Dropped (fallen out), Noisier (sounds louder), Sisters (twin girls)
Down: Rodents (mice), Florins (silver pieces), Reptile (snake), Endures (puts up with)

A96 (Q100b)

S	H	A	F	T
H	U	L	L	O
A	L	L	A	Y
F	L	A	K	E
T	O	Y	E	D

A97 (Q104) The names are all anagrams:

Zena le Vue = Venezuela (the Americas)
Dr A. Glebe = Belgrade (Europe)
Rob E. Lumen = Melbourne (Australasia)
Ann Ziata = Tanzania (Africa)

A98 (Q108) In the **cove** near **hove rafters** tend to **rake** and **span** and **slot** home on **buildings**.

In the same **cove** your **outer charm** will be the **downfall** of a **gang** of **husky gamblers**.

You can **hear** the **snide** remarks of a **wisp** of **blushing kennel** maids as they **drift** and **clamour** and **mingle** and **hover** and **cry** at the **observance** of a **dray full** of **troops**.

Coven of Witches	Gam of Whales
Hover of Crows	Earth of Foxes
Rafter of Turkeys	Nide of Pheasant
Erst of Bees	Wisp of Snipe
Rake of Colts	Blush of Boys
Span of Mules	Kennel of Raches
Sloth of Bears	Drift of Wild Pigs
Building of Rooks	Clamour of Rooks
Covey of Partridge	Glean of Herrings
Rout of Wolves	Hover of Crows
Charm of Finches	Cry of Hounds
Down of Sheep	Observance of Hermits
Fall of Woodcock	Rayful of Knaves
Gang of Elk	Troop of Foxes
Husk of Hares	

A99 (Q39a) Misapprehension

A100 (Q19) $((1{\cdot}5 + 0{\cdot}25) \times \frac{60}{50})$

= 2·1 mins or 2 minutes 6 seconds

A101 (Q20c) 2943/17658

A102 (Q57c)

25	10	3	6	21
22	12	19	8	4
11	9	13	17	15
2	18	7	14	24
5	16	23	20	1

A103 (Q29) 58 inches

The ordinary schoolboy would rightly treat this as a quadratic equation. Here is the actual arithmetic.

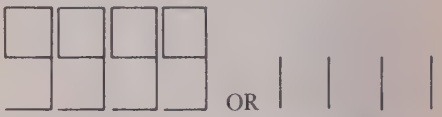
Double the product of the two distances from the walls. This gives us 144, which is the square

of 12. The sum of the two distances is 17. If we add these two numbers, 12 and 17, together and also subtract one from the other, we get the two answers: either 29 or 5 was the radius, which means that the diameter was 58 inches or 10 inches. A table of the latter dimensions would be absurd, so the former must be correct.

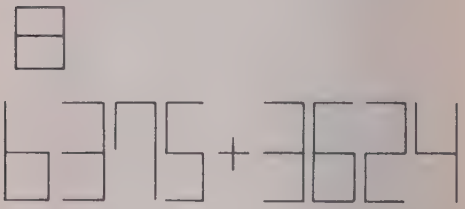
A104 (Q44) Enrage, Geisha, Haggle, Legato, Topple, Legion, Onrush, Shaken

A105 (Q67) 79 years (there was not a year 0)

A106 (Q89)



The sum consists of the *unused* segments when displaying the numbers of a seven-segment LED display: that is,



A107 (Q77) This is a straight substitution cryptogram where each letter of the alphabet is represented by its own symbol. Decoded the quotation reads: 'The least thing upset him on the links. He missed short putts because of the uproar of butterflies in the adjoining meadow.' P. G. Wodehouse

A108 (Q1) Bed. All words can be prefixed with Hot.

A109 (Q98)

R	U	D	E	R
U	V	U	L	A
D	U	C	A	T
E	L	A	T	E
R	A	T	E	D

S	O	L	I	D
O	P	E	R	A
L	E	G	A	L
I	R	A	T	E
D	A	L	E	S

A110 (Q73) 40. There must have been an even number of men to receive the answers given.

A111 (Q14b) Reservation

A112 (Q57b)

17	5	10	20	13
16	23	14	8	4
11	7	1	25	21
2	24	18	9	12
19	6	22	3	15

A113 (Q7) All begin with the number one in a different language:
(En)umerate – Danish
(Uno)ccupied – Italian and Spanish
(One)rous – English
(Un)usual – French
(Bir)d – Turkish

A114 (Q16) Pomfret, Herring, Lamprey, Halibut
Key anagram: Grouper

A115 (Q90)

3	×	12	÷	3	=	12
+	■	+	■	+	■	×
9	+	15	÷	3	=	8
÷	■	÷	■	−	■	÷
3	+	9	÷	2	=	6
=	■	=	■	=	■	=
4	×	3	+	4	=	16

A116 (Q42) 1. Cast 2. Song 3. Rest 4. Foot 5. Over 6. Word 7. Hill 8. Wind 9. Rush 10. Face

A117 (Q37a) Notwithstanding

A118 (Q54) I, It, Fit, Wend, Motet, Tattoo, Shunned, Lethargy, Casserole

A119 (Q13a) The theme is mammals: Beaver (rave be), Porcupine (upper coin), Whale (he law), Dolphin (hold pin), Anteater (neat rate), Leopard (role pad), Muskrat (rum task)

A120 (Q93) The Law of the Search: 'The first place to look for anything is the last place you would expect it to be.'

A121 (Q96) *Across:* Jamb, Chintzy, Elk, Fops
Down: Waxy, Quivers, Dog

A122 (Q60)

13	8	12	1
2	11	7	14
3	10	6	15
16	5	9	4

A123 (Q88) Yes, in 166 seconds

54 seconds = 0·9 minutes, reciprocal* = 1·11
48 seconds = 0·8 minutes, reciprocal = 1·25
add 2·36
30 seconds = 0·5 minutes, reciprocal = 2·00
Reciprocal = 2·777 minutes deduct 0.36
= 166 seconds

* In mathematics, a reciprocal is a number or quantity which, when multiplied by a given number or quantity, gives the product of 1, that is, 0·8 × 1·25 = 1. To find the reciprocal of 0·8, it is necessary to divide 1 by 0·8, which gives the reciprocal 1·25.

A124 (Q111) Len. The letters of his name are contained in his relationship to me, uncle, as was the case with the other relatives mentioned.

A125 (Kickself introduction) They were triplets, and the third one was a girl.

A126 (Q9) CACOPHONY

O	P	C	N	C	P
C	Y	H	O	Y	O
C	P	A	C	O	N
H	N	O	C	A	H
A	Y	P	H	Y	O
O	C	A	N	O	C

A127 (Q74) Total up each group of three numbers and take the corresponding letter of the alphabet. Decoded the message reads: 'The paradox is a cunning beast.'

A128 (Q107) In both cases only two.

A129 (Q84) *Across:* Careers, Natives, Forgone, Resists
Down: Conifer, Retires, Envious, Systems

A130 (Q95) $7^3 - 6^3 - 3^3 = 100$
$1870^3 - 1797^3 - 903^3 = 100$

A131 (Q69) As water is slightly heavier than wine, if you remove the bung, remove the bottle cap, upend the full bottle of water over the bung hole and make a good seal, the water will be exchanged for wine.

A132 (Q47) B. Each shape moves round once clockwise at each stage. The dot moves two positions. Once the dot has landed in a particular shape, that shape then changes to a new shape in the next diagram.

A133 (Q76–2) 'The man who smiles when things go wrong has thought of someone he can blame it on.' Jones' Law

A134 (Q103) 24 minutes.

There are two simple formulas for working out the answer to this puzzle.

(a) Total time difference, 30 minutes, less time saved, 12 minutes – that is, 18 minutes – plus one half time saved – that is, 6 minutes = 24 minutes.

(b) Subtract one half time saved, 6 minutes, from total time difference, 30 minutes = 24 minutes.

If you do not know either of the formulas, the answer can be worked out by logic. As I leave according to my usual schedule, we know it is

before 5.30 p.m. when I pick up my wife. Because we have saved 12 minutes, that must be the same time that it takes me to drive from the point I picked her up, to the station, and back to that same point. Assuming it takes an equal 6 minutes each way I have therefore picked up my wife 6 minutes before I would normally do so, which means 5.24 p.m. So my wife must have walked from 5 p.m. to 5.24 p.m. or for 24 minutes.

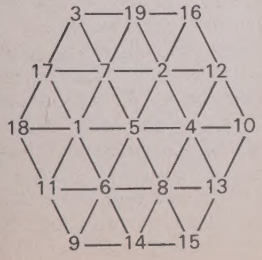
A135 (Q91)

Paint Red	Blue	Faces	Possible ways of painting
12	0		2
11	1		2
10	2		6
9	3		10
8	4		24
7	5		28
6	6		24
			96

A136 (Q38) Categorise, Feathered, Woebegone, Together, Attendance, Fatherless, Inhabitant, Malefactor, Redevelop, Damageable

A137 (Q26) *Across:* 4489, 1225, 4761, 2809, 3969, 5329, 4225, 3136
Down: 2916, 1156, 6561, 7921, 4624, 5929, 9604, 3249

A138 (Q62)



A139 (Kickself introduction) No doors are shown, so they must be on the opposite side. This would then be the kerb side. In Britain the bus would therefore be travelling towards 'B'.

A140 (Q65) It contains the numbers 1 to 9 in alphabetical order.

A141 (Anagrams introduction) Bayonet

A142 (Numbers introduction) 381654729

A143 (Word Play introduction) 1. Cleave 2. Sequoia 3. Triennially (Tinily and Renal) 4. Nominates (Minnesota) 5. Manufacture (also, of course, Manufactured, Manufacturer/s, Manufacturing) 6. Queueing 7. Best, Worst 8. Typewriter

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